LARGE SYSTEMS AND ATC -English

Authors note

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This is a copy of my articles in my blog named
LARGE SYSTEMS AND ATC -English. Unfortunately, a few
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copy of the article you are interested in.
Gracias.

<title>Large Systems and ATC</title>

<title>The Function of Volition in Providing Consciousness</title>

-Love stays vigil through thinking-

Volition is a form of feeling. Consciousness is a higher function which determines the form of cognition.

There are various types of consciousness[2]:
- Reflected
- Pre-reflected
- Others

In the reflective or observing consciousness one is aware of his/her self. One uses the subject 'I' in his/her inner talk. One observes what he/she id doing and is aware of it being done by one's self[4].

In the pre-reflective, non-observing consciousness one is not aware of what he/she is doing. For example one is not aware of how he has driven from home to job. Tasks are done without the observational awareness.

Intention is a form of volition. Intention depends on the condition based on time, place, event or other. Intention mechanism can be vitally important to exit or in being unable to exit pre-reflective consciousness in the cases of emrgency or contemplation.

Intent and volition limit and direct cognition[3].

Feelings think.

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<title>MATCHING - THE ROLE OF EMOTIONS IN ENGINEERING</title>

You may wonder what relation do emotions have with engineering? Engineering is considered mostly in relation with mathematics and other positive sciences. This misconception arises from the wrong systems definition that we use to make. A system may roughly be defined as a structure that produces certain outputs for certain inputs outcome of which may be affected by some distortions from the environment. Although there exists a user in the real life which is excluded in this definition?

The inclusion of the user to the definition of the system may become a necessity in some cases. The complexity or largeness of the systems that are used requires the inclusion of the user to the system design. For ex. the safety and security of an airplane depends largely on the flight crew.
Thus the design of the system is designed according to this phenomenon.

An Air Traffic Control system, a nuclear reactor or even a traditional electric reactor, any system of which safety or security is vital depends on a single main human feeling: TRUST.
The pilots have to trust the air traffic controllers, the controllers have to TRUST the control devices and the engineers who develop and maintain them. The difficulty is not in assembling an electronic device box or running an assembler program but to BUILD THE TRUST of the users to this box or program.

Indeed, if you think a little bit, you may share the idea that, even though it is never expressed explicitly, from requirements to delivery and, from the calculation of costs to long term maintenance and enhancement, all over the project lies small and large, many conditions, suggestions and advises related to TRUST.

A good and successful engineer is one that you can easily trust, one that works like worshipping, one whose word is always true and when it is not, one who makes all the sacrifices to make his word come true with dignity, one who has no lies, no tricks, no guiles, one that can never be bribed, one does everything in his hand not to bribe and when he is obliged to do so one who knows very well that bribing hurts his very own efforts. Bribery and other kinds of social decay hurts first of all the feeling of TRUST in LARGE SYSTEMS and the projects that develop them.

When inspected closer, it can be easily seen that emotions such as fear and compassion may play secondary but important roles in some of the engineering projects? These effects can be observed in the behaviour of the teams at the end of the big projects or in the behavioural patterns of people performing jobs that may affect the lives of many people? The management of a project is not the

application of some patterns such as MIL498, ISO12207 in a 'military style' without understanding their spirit.

The ability to control the motivation of a team and to lead it successfully through an engineering project lies in managing the emotions of that team. If you suggest otherwise, I would like to pose this question to you: The job is exciting, the payments are satisfying, then why do some of the engineers commit suicide?

You can find the name of a vitally important article related to this subject below at the end of my article. You may not only find the basis of some of my opinions above, but also health problems related to concentrating too much for too long durations, etc. which are related to the affective fundementals of large systems psychology. I will be concentrating on affections - affective disorders etc. subjects related to emotions in engineering in the near future.

Of course, belongs the last word to CONSCIENCE European Organisation for the Safety of Air Navigation(EUROCONTROL)'s civil servant evaluation form which is filled every two years, has 12 items. One of these 12 items is 'professional conscience'. May the forthcoming LARGE SYSTEMS companies of our ountry not forget the 'professional conscience' in their personnel evaluations. May our country not 'give herself up' to the European Union just for realizing this kind of simple things

Ali R+ SARAL

Note: Please continue to Brian Bayly's The Brain's Internal Reward from Matching which you can find on the Internet. I have done a Turkish translation and editing of this article also. You may find it in the same blog. It resides here in the Turkish version.

<title>Relaxing After High Concentration - 2</title>

To Forget - To Empty the Mental Energy

What does 'mentally relaxing' mean? It is to forget the thing you have focused your attention on together with its semantical relations. Namely, to forget what you pay attention to and its relations.

To concentrate is focusing your attention to a certain subject and remember related things , thus forget the unrelated things. Hence you erase things unrelated to the subject from your working memory. You remember and bring relavent things into your working memory instead.

In fact the working memory of the mind should not be viewed like a computer addressed page. It should be viewed as a network and even networks of networks of which connection weights can be adjusted and reduced to null.

When focusing the weights of connections between some specific neurons increase. These neurons have to be related to the subject and may be located at various parts distributed in our brain.

High concentration occurs when the application duration ofdedicated attention and the character of focusing is augmented. Long duration high concentration occurs when concentration on a subject continuously for three or six months. The mind accumulates a large amount of information on a specific subject and tries to find a solution (for example in large software projects).

In the case of long duration high concentration, the brain adds buffers related to perception to the working memory and the short term memory layer(episodic and other). The slowness in the body movements of large systems engineers or the behaviour of surgeons after operations, for ex. Both group has the tendency to put their personal belongings always to the same locations... are the result of extreme mental load. This difficulty is the result of the working memory expanding over average size and short term memory getting overloaded with too many relations. Episodic memory and buffer memories related with basic senses get added to the working memory. The situation gets to the stage that you begin to forget simple things such as you have stopped at the previous red light. Smell and taste senses get weaker.

Under heavy load, the brain does not only lncrease the relations of the elements in the subject matter but also takes meaures to increase the relational mechanisms and elavating precautions. It changes the neuraş networks' propogational properties by making the body secrete hormones. Hence, thresholds for making decisions change and it gets easier to resolve a decision regardless of whether it is right or wrong. The hormones that affect this, affects the person's affections also. It is not a coincidence that engineers get increasingly more sensitive at the end of difficult projects or calm people get belligerent... Strangely, things get calmed down by the end of the project.

The commands that the brain sends to the body under heavy mental load affects not only the affective behaviour and decision thresholds of the person. The affective changes affect the thinking speed also. The new propogation conditions created by the hormones does not only affect the macro level decision making but also affects the micro events of relational connection establishing and determination of connection weights. For ex. The abrupt and mostly correct reactions shown under emergency conditions depend on the adjustment of the thinking speed as well as automatic processes.

A global result of high and long duration concentration is that the mental control ability of the person increases over normal levels. An indication of this is the increase in the speaking native and foreign languages ability, also an increase in the perception sensitivity. You begin to notice things on your computer screen that you normally did not see before. You begin to remember the relational details of past events that you have not noticed before.

An even more increase of the thinking speed causes serious problems. You begin to see halucinations or hear sounds. Difficulties in using the language begin. You begin to hear other languages when speaking your native tongue. The same problems recur in your mind continuously.

A person under stress has difficulty to forget(interalia). The inability to put aside everything and to look at problems with a fresh mind stops the chance of finding solutions as well as deepening of the mental disturbance. It may not be a good solution to go to a long nice vacation in this situation. When you open the house door on your return, you will find the same problems exactly as you have left them behind.

If paid attention the stages that the problem occurs most seriously give strong clues to its solution. Forgetting is one of these. If we can forget even some details of the things that happened after a mentally loaded day, if they do not come back to your mind this means everything is OK.The key to relaxing, to stay away from the bad effects of high concentration is forgetting.

Forgetting destroys the semantic relations network formed by the high concentration, erases the connection weights created for this network. The destroying-reduction of the connection weights reduces the cognitive ability and slows down the thinking speed. Although speed is a chemical or hormonal phenomenon logical structure may have a slowing effect on the speed.

Forgetting, specifically forgetting the context, reduces the load on the memory hence reduces the enforcement of the perception buffer memories to act as the working memory. The speed of the forgetting process may cause negative effects after heavy concentration periods. The person begins to get interested with many cmopletely unrelated subjects using the mental capacity he/she has created. Such as pushing self to remember details of things in the past, thinking extremely abstract subjects. He tries to continue to push self mentally with other activities.

When stopping long duration high concentration or even stopping the daily working process,mental activities with increasingly lower densities may help. One should leave some time to the brain to adjust. For example, listening English news first, then Turkish news, and then an art program and then an entertainment program... Close the TV and sip some tea on your favorite armchair...

By the way, what does normal people do when they use high concentration sometimes? They do not do anything intentional. Their physique and the personality that they have developed protects them. The problem occurs on people who work on large systems with critical responsibilities, concentrating highly for long durations or jobs requiring to carry a subject in one's mind for long durations. These people break down the resistence their brains show to high concentration by material or immaterial motivations. If these people are not trained to take precautions against these problems they become prone to serious mental risks.

When your mind gets tired your attention drops and you begin to think different subjects. As an example to your mind taking autonomous precautions is seeing halucinations when the thinking speed increases too much. Infact halucination is a way of getting rid of excessive mental energy.

Your behavioural patterns may have a protective effect. For example, a person under heavy load tries to act using more plans. Programming and planning, designing require a high amount of mental effort hence, help to empty the brain from mental energy. These not only organize the tasks to do but also helps to spend the excessive mental energy.

The problem is the excessive increase in the mental energy and the thinking speed because of the excessive concntration. They remain at these high levels for durations as long as 3 - 6 months and they do not drop down to normal levels during this long period of time. This unreducing mental energy and thinking speed causes permanent changes in the brains of the related employees. The employees must be trained against the bad side effects of long duration high concentration and they must be screened psychologically in a systematic way.

My next article will propose a method to relax for large systems employees who have critical duties. The most important problem with a tired mind is being unable to forget that day and its difficulties. There must be some memory mechanisms in order to forget easily. If we can analize these mechanisms carefully may be we can develop some useful techniques.

<title>How to Regulate Emotions</title>

The crux of this article from the point of daily application is:

 Emotional processing can also be modulated through deliberate and conscious application of top-down executive control over processing of an emotional stimulus.

You can find how this is done:
1- One page outline made of quotations from the original article
2- 4 Pages of my notes made of quotations from the original article
3- Original article itself.

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Emotional processing in anterior cingulate and medial prefrontal cortex
Amit Etkin1,2, Tobias Egner3 and Raffael Kalisch4

In summary, the pattern of anatomical connectivity supports an important role for the sgACC, pgACC and adACC in interacting with the limbic system, including its effector regions, and for the adACC and pdACC in communicating with other dorsal and lateral frontal areas that are important for top-down forms of regulation [72].

Fear conditioning and extinction in humans

Thus, the dorsal ACC and mPFC seem to function generally in the appraisal and expression of fear or anxiety.

To elucidate how fear is regulated, we next discuss activations associated with extinction of learned fear. In extinction, the CS is repeatedly presented in the absence of reinforcement, leading to the formation of a CS(conditioned stimulus)-no US(unconditioned stimulus) association (or extinction

memory) that competes with the original fear memory for control over behavior [28-30]. Hence, extinction induces conflicting appraisals of, and response tendencies to, the CS because it now signals both threat and safety, a situation that requires regulation, as outlined above.

Emotional conflict regulation
The circuitry we find to be specific for regulation of emotional conflict (ventral ACC and mPFC and amygdala) is very similar to that involved in extinction.

Top-down control of emotion
During emotional conflict regulation, emotional processing is spontaneously modulated in the absence of an explicit instruction to regulate emotion. Emotional processing can also be modulated through deliberate and conscious application of top-down executive control over processing of an emotional stimulus. The best-studied strategy for the latter type of regulation is reappraisal, a cognitive technique whereby appraisal of a stimulus is modified to change its ability to elicit an emotional reaction [42]. Reappraisal involves both the initial emotional appraisal process and the reappraisal process proper, whereby an additional positive appraisal is created that competes with the initial negative emotional appraisal.

These data suggest that controlled top-down regulation, like emotional conflict regulation, uses ventral ACC and mPFC areas to inhibit negative emotional processing in the amygdala, thus dampening task interference.

The ventral ACC and mPFC might thus perform a generic negative emotion inhibitory function that can be recruited by other regions (e.g. dorsal ACC and mPFC and lateral PFC) when there is a need to suppress limbic reactivity [10].

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Emotional processing in anterior cingulate and medial prefrontal cortex
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Negative emotional stimuli activate a broad network of brain regions, including the medial prefrontal (mPFC) and anterior cingulate (ACC) cortices. An early influential view dichotomized these regions into dorsal-caudal cognitive and ventral-rostral affective subdivisions. In this review, we examine a wealth of recent research on negative emotions in animals and humans, using the example of fear or anxiety, and conclude that, contrary to the traditional dichotomy, both subdivisions make key contributions to emotional processing. Specifically, dorsal- caudal regions of the ACC and mPFC are involved in appraisal and expression of negative emotion, whereas ventral-rostral portions of the ACC

and mPFC have a regulatory role with respect to limbic regions involved in generating emotional responses. Moreover, this new framework is broadly consistent with emerging data on other negative and positive emotions.

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Glossary

Appraisal: evaluation of the meaning of an internal or external stimulus to the organism. Only stimuli that are appraised as motivationally significant will induce an emotional reaction, and the magnitude, duration and quality of the emotional reaction are a direct result of the appraisal process. Moreover, appraisal can be automatic and focus on basic affective stimulus dimensions such as novelty, valence or value, or expectation discrepancy, or may be slower and sometimes even require controlled conscious processing, which permits a more sophisticated context-dependent analysis.

Fear conditioning: learning paradigm in which a previously neutral stimulus, termed the conditioned stimulus (CS), is temporally paired with a non-learned aversive stimulus, termed the unconditioned stimulus (US). After pairing, the CS predicts the US and hence elicits a conditioned response (CR). For example, pairing of a tone with a foot shock results in elicitation of fear behavior during subsequent responses to a non-paired tone.

Extinction: learning process created by repeatedly presenting a CS without pairing with an US (i.e. teaching the animal that the CS no longer predicts the US) after fear conditioning has been established. This results in formation of an extinction memory, which inhibits expression of, but does not erase, the original fear memory.

Reappraisal: specific method for explicit emotion regulation whereby a conscious deliberate effort is engaged to alter the meaning (appraisal) of an emotional stimulus. For example, a picture of a woman crying can be reappraised from a negative meaning to a positive one by favoring an interpretation that she is crying tears of joy.

Regulation: general process by which conflicting appraisals and response tendencies are arbitrated between to allow selection of a course of action. Typically, regulation is thought to have an element of inhibition and/or enhancement for managing competing appraisals and response tendencies.

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Box 1. Anatomy of the ACC and mPFC

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In summary, the pattern of anatomical connectivity supports an important role for the sgACC, pgACC and adACC in interacting with the limbic system, including its effector regions, and for the adACC and pdACC in communicating with other dorsal and lateral frontal areas that are important for top-down forms of regulation [72].

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Fear conditioning and extinction in humans

The paradigms used in the acquisition and extinction of learned fear are particularly valuable for isolating the neural substrates of fear processing because the anticipatory fear or anxiety triggered by the previously neutral conditioned stimulus (CS) can be dissociated from the reaction to the aversive unconditioned stimulus (US) per se. This is not possible in studies that, for example, use

aversive images to evoke emotional responses. Furthermore, comparison between fear conditioning and fear extinction facilitates an initial coarse distinction between regions associated with either the appraisal of fear-relevant stimuli and generation of fear responses (fear conditioning), for the inhibitory regulation of these processes (extinction).

...

sympathetic nervous system activity correlates positively primarily with dorsal ACC and mPFC regions and negatively primarily with ventral ACC and mPFC regions, which supports a role for the dorsal ACC and mPFC in fear expression (c).

...

These processes are intermixed with, and supported by, learning processes, namely, acquisition, consolidation and storage of a fear memory (CS-US association), and retrieval of the fear memory on subsequent CS presentations.

...

Thus, the dorsal ACC and mPFC seem to function generally in the appraisal and expression of fear or anxiety.

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To elucidate how fear is regulated, we next discuss activations associated with extinction of learned fear. In extinction, the CS is repeatedly presented in the absence of reinforcement, leading to the formation of a CS-no US association (or extinction memory) that competes with the original fear memory for control over behavior [28-30]. Hence, extinction induces conflicting appraisals of, and response tendencies to, the CS because it now signals both threat and safety, a situation that requires regulation, as outlined above.

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Emotional conflict regulation

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The circuitry we find to be specific for regulation of emotional conflict (ventral ACC and mPFC and amygdala) is very similar to that involved in extinction. ... Much like the relationship between improved emotional conflict regulation and decreased conflict evaluation-related activation in the dorsal ACC and mPFC, more successful extinction is associated with decreased CS-driven activation in the dorsal ACC and mPFC of humans and rodents [40,41]. Thus, the most parsimonious explanation for these data is that emotional conflict evaluation-related functions involve overlapping neural mechanisms with appraisal and expression of fear, and that regulation of emotional conflict also involves circuitry that overlaps with fear extinction.

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Top-down control of emotion

During emotional conflict regulation, emotional processing is spontaneously modulated in the absence of an explicit instruction to regulate emotion. Emotional processing can also be modulated through deliberate and conscious application of top-down executive control over processing of an emotional stimulus. The best-studied strategy for the latter type of regulation is reappraisal, a cognitive technique whereby appraisal of a stimulus is modified to change its ability to elicit an emotional reaction [42]. Reappraisal involves both the initial emotional appraisal process and the reappraisal process proper, whereby an additional positive appraisal is created that competes with the initial negative emotional appraisal. Thus, we would expect reappraisal to involve the dorsal ACC and mPFC regions that we observed to be important for emotional conflict detection (Figure 2a).

Consistent with this prediction, a meta-analysis found that reappraisal was reliably associated with activation in the dorsal ACC and mPFC (Figure 2b) [43].

This reappraisal meta-analysis, interestingly, did not implicate a consistent role for the ventral ACC and mPFC [43], which suggests that reappraisal does not primarily work by suppressing the processing of an undesired emotional stimulus. Nevertheless, activity in the ventral ACC and mPFC in some instances is negatively correlated with activity in the amygdala in paradigms in which reappraisal resulted in downregulation of amygdalar activity in response to negative pictures [44,45]. ...
These data suggest that controlled top-down regulation, like emotional conflict regulation, uses ventral ACC and mPFC areas to inhibit negative emotional processing in the amygdala, thus dampening task interference. The ventral ACC and mPFC might thus perform a generic negative emotion inhibitory function that can be recruited by other regions (e.g. dorsal ACC and mPFC and lateral PFC) when there is a need to suppress limbic reactivity [10]. This would be a prime example of parsimonious use of a basic emotional circuitry, conserved between rodents and humans (Box 2), for the purpose of higher-level cognitive functions possible only in humans.
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Amygdala-ACC and -mPFC functional connectivity
...
In addition, during regulation tasks, connectivity was restricted to the ventral ACC and mPFC and was primarily negative (Figure 2d). These data thus lend further support to our proposal of a dorso-ventral separation in terms of negative emotion generation (appraisal and expression) and inhibition (regulation).
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Integration with other perspectives on ACC and mPFC function and other emotions
Although less developed than the literature on fear and anxiety, studies on other emotions are broadly consistent with our formulation of ACC and mPFC function. On the negative emotion appraisal and expression side, direct experience of pain, or empathy for others experiencing pain, activates the dorsal ACC and mPFC [49], and lesions of the dACC also serve as treatment for chronic pain [50]. Similarly, increased sensitivity to a range of negative emotions is associated with greater engagement of the dorsal ACC and mPFC, including disgust [51] and rejection [52], and transcranial-magnetic-stimulation-induced disruption of the dmPFC interferes with anger processing [53]. Uncertainty or ambiguity, which can induce anxiety and relates to emotional conflict, leads to activation in the dACC and dmPFC [54].
...
Positive emotion, which can serve to regulate and diminish negative emotion, has been associated in a metaanalysis with activation in the sgACC, vmPFC and pgACC [58]. Extinction of appetitive learning activates the vmPFC [59], much as extinction of learned fear does. The evaluation of positive stimuli and reward is more complicated. For instance, Rushworth and co-workers proposed that the processes carried out by the adACC are mirrored by similar contributions to reinforcement-guided decision-making from the orbitofrontal cortex, with the distinction that the adACC is concerned with computing reinforcement value of actions whereas the orbitofrontal cortex is concerned with gauging the reinforcement values of stimuli [60].

Taken together, these data broadly support our dorsal-ventral distinction along appraisal-expression versus regulation lines, with respect specifically to negative emotion.
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<title>The Singularity of Mind</title>

Mein Sohn! Tue das, was in (deinem) Herzen (ist)
My son! Do what in your heart is.

Cognition exists as the processes of division or unision. The difficulty of the unknown is divided to its parts and a solution turns out to knowledge when united with the existing solutions.

Mind exists abstractly as a complex system of functional abilities of the brain. When the brain is faced with a difficulty it divides itself to different compartments. Infact, in the beginning of self, when a two year old child is faced with the difficulty of speaking, he/she chooses inevitably to identify self. Speaking forces the use of 'I' hence dividing the world as others and 'self'. Camın Ötesine Geçmek( )

The child mind's skill of dividing self to face difficulties continues in the rest of the life. We develop many subpersonalities to handle the difficulties of various contexts that we live in our daily life, father/mother, family relations, job relations, neighbors, friend circles, professional expertises etc.

Through all the divisions that mind undergoes, one thing remains constant, self-consciousness. Individual percieves self as a single person that he knows as. Sometimes we feel ashamed or we can not associate what we do with what we feel ourselves as but still the reference to the self remains constant. OR sometimes we do things that we accept we do not expect to achive by ourselves.

One reason that causes the sense of constant self-perception is the basic education and the cultural tendency of the society at that period of time. I believe, the Turkish society is still living a predominantly romantic period and this is effecting the child rear up and the self-perception of the grownups.

Singularity of the human-mind is a wrong perception taught by the society, child bring up, basic education, religion and so on. Infact, research in the last 20 years have physically proved that, for various functions of mind, different sections of brain gets activated.

The below quotation is taken from the sum up section of:
PREFRONTAL AND ANTERIOR CINGULATE CONTRIBUTIONS TO VOLITION IN DEPRESSION
Jack B. Nitschke and Kristen L. Mackiewicz
Waisman Laboratory for Brain Imaging and Behavior
Departments of Psychiatry and Psychology, University of Wisconsin

It explains how the human volition is implemented by the brain. Two specific and distinct regions interact to achieve the volition function.

In this chapter, we have outlined two constituent components in the neural circuitry of volition: the DLPFC and the ACC. These structures have distinct roles that contribute to the selection and implementation of action plans.

DLPFC and ACC's functions:
Subserving cognitive control, the DLPFC is involved in the representation and selection of goals and in the implementation of action plans and behavioral change.

The ACC has been implicated in monitoring conflict among external and internal cues, with the dorsal ACC modulating cognitive aspects and the ventral ACC more involved in affect.

Interaction between ACC and DLPFC:
It plays a central role in signaling and recruiting additional brain regions, particularly the DLPFC, to resolve the conflict and initiate the appropriate action.

Collective function of both:
Working in concert, these two key regions form the cornerstones of the neural signature of volition, especially with regard to the implementation of volitional action plans.

The cascade of events that occurs allows for the eventual selection of new goal-directed behaviors that override previously established behavior patterns.

Our brain is formed of many centers and works like a dynamic complex multiprocessor system. But human mind percieves self as a single unity. Infact, there are some cultural hints that point out to some possibilities of making use of the multiplicity of the brain.

Daisuke YOSHIDA's book Die Syntax des althethitischen substantivischen Genitivs page 5 alludes to An Anatolian Hittite King's thousands of years old advise:

Mein Sohn! Tue das, was in (deinem) Herzen (ist)
My son! Do what in your heart is.

The seperation of decision processing between two seperate centers, brain and heart clearly resembles the DLPFC and ACC processing...

If throughly studied one can find similar cultural elements in relation to the thinking-processing speed. The brain uses different types of processing for different tasks. For example, things related to safety requires a clear and unhesitating, calm mind. This may be related to not only the character of the situation processed but also the specific processing center(s) being used for that task.

An notorious other multiplicity is the emotions and cognition split. When carefully studied one can easily find the strong affects of romantism in the Turkish culture in this area. The tendency to bring up children with a singular mind is reflected in the feel-think duality and the importance of feelings etc...

I believe, in a century with increasing complexity of systems that we use, we are faced with the necessity of changing our education and child bring up systems. We should stop bringing up people who concentrate uncontrollably when faced with emergencies or difficulties. We should stop creating human triggers who can not change what they do once they are trigged. We should train flexible people who can react to big emergencies but return to normal function afterwards in a short while.
We should bring up controllers who can control may be 2-3 times more air traffic using more complex and sophisticated systems.

This is a task much further than that can be achieved with current computer games or action movies. We are faced with an immense task of changing our education and child bring up system in order to create the modern individual who can percieve his own depths of multiplicity and use the hidden advantages against the terrible risks.

<title>ON THE NATURE OF PROBLEMS</title>

Fighting Techniques II

To the memory of our father Hasan SARAL.

the chemist Kekule came upon one of the most important discoveries of organic chemistry, the structure of the benzene ring, in a dream. Having pondered the problem for some time, he turned his chair to the fire and fell asleep:'Again the atoms were gamboling before my eyes. My mental eye could now distinguish larger structures all twining and twisting in snkae-like motion. But look! What was that? One of the snakes had seized hold of its own tail, and the form whirled mockingly before my eyes. As if by a flash of lightning I awoke. The spontaneous inner image of the snake biting its own tail suggested to Kekule that organic compounds, such as benzene, are not open structures but closed rings[1].

Everyday, we fight with many difficulties of many kinds. Some of these are as simple and short as loosening of the shoelaces. Some of them are as difficult and long as making an invention and some of them as abrupt and serious as a traffic accident If you have a look at the many problems that we fight with you will notice that we can categorize them and their solutions in different groups. Although these groups may carry similarities in their quantity, quality and content attributes, their use by individual persons and the importance assigned to them may differ. Also, even though the problems and their solutions may be similar the personalities of the individuals that they interact may cause them to appear different.

Studying the nature of problems makes it possible for us to solve similar problems easily and also understand ourselves better We can categorize problems in various ways. For example, problems that repeat endlessly are called chronic in medicine. I am afraid, some of our political problems may be called the same. On the other hand some problems are seasonal. For example, opening the streets to transportation by cleaning the snow. These problems repeat with more or less a certain period. Acute problems happen suddenly and are serious to handle. For example, a sewage pipe gets broken in your house Some problems are ubiqutious. You meet them in many areas of life. Some are wide spread with

in a limited area. Your computer program does not work. When nothing works at all you have made a main mistake with wide results. Focused problems affect a certain functionality and the system recovers as soon as you fix it. Like a tooth ache

Some problems are light but persist for a long duration. In fact, we can group the problems by their durations that they sustain, short - long etc. or according to their largeness. The way the problems happen may be classified also. Few or many in quantity. Fighting with more than one problem at the same time increases the total difficulty. The way we categorize problems is not constant. It changes according to the subject of the problem and the context it happens. To put a tiny piece of thread through a sewing needle may be percieved as difficult while a much more concentration demanding computer programming task may be percieved easier, just like a technical problem may be percieved much more difficult after midnight than at noon.

The fact that our perception of the problems is variable makes our categorization of the problems more difficult and hence reduces the benefit that arises from the categorization. If you are throwing anything you get hold of to your target in a chaos that you can not apprehend you have come to that point where you have to take a deep breath and try to categorize the problems correctly. If you can categorize the problems as convenieint as possible to reach the target your chance of hitting your target via a similar solution. Solving problems is basically a problem of classification.

I had mentioned the chronic problems in the beginning. The word 'chronic' means ': marked by long duration or frequent recurrence' by Merriam-Webster. The most apparent characteristic of a chronic problem
is repetition or continuity. Reduction of the repetition intervals indicates that the problem gets severe or light. For example, a severe crisis give way to the lighter ones but more frequent or irregular problem periods, or the increase in the severity of problems and the increase of the frequency may indicate a worsening.

The repetition of the problem in chronic problems may happen in various ways:

1-The problem arises in a flow of random events. The crux of the issue here is; the events other than the chronic problem are random and carry no relation with the problem.

2- The chronic problem happens after a chain of happening events. After each occurence things repeat the same iteration of events. In this case, repeating event is not only the chronic problem but the events that prepare it.
The events' iteration does not have to be constant array of events. The presence of some events may be obligatory, but two seperate iterations may be composed of completely different events. But most of the events that form the iteration belong to the set of events that form the reasons of chronic problem.

If we look at a chronic problem from a closer point of view, we may observe that a single crisis begins at a moment in time, continues and finishes, or the problem has begun at a moment and continues for a long duration without any interruption. Aset of the general conditions that prepare the outbreak of the crisis, a set of the causes that push the events to happen and a set of the triggers which may come just

before the crisis may be observed. In the case of the repeating crisis, there is a set of conditions that prepare, a set of causes that make it happen and a set of triggers that initiate the end of the crisis.

One component of the equation that gives rise to the chronic event is a function which may change by time but may also be accepted as constant for relatively short periods of time. This function may be related to the events in the past or to the material dependent on the nature of the interacting elements/participants of the problem.

When studided closely, the reasons, the causes and the triggers that lead to the outbreak of the crisis may be related to their own previous values and also may be related to the previous crises values. For example, the seriousness of a previous crisis, its duration, its attack/sustain/release durations. Sometimes the slowness of the evolution of the problem, namely slowness in its attack period, mathematically its 1st and 2nd derivatives being small, or precautions that balance and slow sudden changes may stop the forming of crisis episodes. The dependence of the reasons that form the chronic crisis to the characteristics of previous crises and to its own evolution leads to the unmanageable repetition of a chronic problem.

Above, I had mentioned a chronic problem that occurs among unrelated random events. There may be such problems that may be dependent on only themselves and their own past iterations. These self triggering chronic problems are recursive[3] in nature. In fact they may be evaluated as a special case of functions mentioned in the 2. item.

If I may return back to the beginning of this article, if we have a closer look at the story of the chemist who found the benzene ring, we may now come to appreciate the value of the symbol 'the snake which bites its own tail'. The metaphor of 'the snake which bites its own tail' or 'the scorpion biting itself' is a method utilized in solving problems that are very difficult. The problem is so difficult that it can not be solved or cured by external effects such as, force, medicine etc. It becomes inevitable that the energy at the source of the problem may be used to kill itself. This kind of solutions may not be present or evident. I believe, chronic problems have the ability to be solved by using the metaphor of 'the snake which bites its own tail' on the premises of their own definition.

Ali R+ SARAL

Note: My simple article 'A Mathematical Model of Chronic Problems' is available at my blog http://tekne-techne.blogspot.com in Turkish.

Kaynaklar:

[1] Rober H. McKim, Experiences in Visual Thinking , Brooks/Cole Pub. Co. Monterey, California, s. 11.
[2] Merriam-Webster Dictionary
Main Entry: chronic
Etymology: French chronique, from Greek chronikos of time, from chronos
Date: 1601
1 a: marked by long duration or frequent recurrence : not acute b: suffering from a chronic disease the
2 a: always present or encountered ; especially : constantly vexing, weakening, or troubling

Medical Merriam-Webster:.
1 a : marked by long duration, by frequent recurrence over a long time, and often by slowly progressing seriousness : not acute Chronic her b : suffering from a disease or ailment of long duration or frequent recurrence chronic
2 a : having a slow progressive course of indefinite duration -- used especially of degenerative invasive diseases, some infections, psychoses, and inflammations chronic-- comparre ACUTE 2b(1) b : infected with a disease-causing agent (as a virus) and remaining infectious over a long period of time but not necessarily expressing symptoms
[3] Merriam-Webster Dictionary
Main Entry: re□cur□sion
Pronunciation: \ri-'k?r-zh?n\
Function: noun
Etymology: Late Latin recursion-, recursio, from recurrere
Date: 1616
1: RETURN 2 : the determination of a succession of elements (as numbers or functions) by operation on one or more preceding elements according to a rule or formula involving a finite number of steps 3 : a computer programming technique involving the use of a procedure, subroutine, function, or algorithm that calls itself one or more times until a specified condition is met at which time the rest of each repetition is processed from the last one called to the first □ compare ITERATION

Main Entry: it□er□a□tion
Pronunciation: \?i-t?-'ra-sh?n\
Function: noun
Date: 15th century
1: the action or a process of iterating or repeating: as a: a procedure in which repetition of a sequence of operations yields results successively closer to a desired result b: the repetition of a sequence of computer instructions a specified number of times or until a condition is met □compare RECURSION 2: one execution of a sequence of operations or instructions in an iteration

<title>The Effect of Feelings on Concentration - II</title>

What is forgetting? Anything which has remained a minimum period of time in our memory gets written in our long term memory. Anything which considerably gains our attention cannot be forgotten at all. There are limits to the quality of remembering though. A healthy person cannot forget his/her parents' names for example. It is a fact that we have increasing difficulty to remember the details of the past as time proceeds. This should not make you think that you have forgotten everything. You lose the means to reach the memories not the memories themselves. Many times has a person got astonished at how many details he remember when he enters the same classroom he has gone to primary school.

What is temporary forgetting? Indeed all forgetting is temporary as we do not forget anything in our long term memory. I mean short term forgetting with temporary. For example when you are eating your

favorite meal you forget the rest of the world. When you are studying for a critical exam you forget the rest of the world. When you go to shopping you forget to buy the most needed item.

Air Traffic Controllers do forget also. After solving a critical situation, it is not rare that they forget they have to handle a secondary one. The large system controllers' brains blank out or forget some critical data sometimes. I remember an airplane accident, in which the pilots socialized with some small talk and forget to enter a route point to the flight computer □

Concentration causes forgetting. It focuses the attention on a certain subject area and considers only things related to this area. This causes the loss of access to the secondary areas and hence the temporary forgetting of them. Situation awareness concept is developed to handle this problem. Situation awareness requires continuous tracing of system variables whenever possible.

Concentrating is good when absolute concentration on a single thing is needed. When a partial attention is required for a specific task besides the task of general surveillance of others it is not good to concentrate too much. Divided attention requires not too much concentration on only one of specific tasks. Concentration causes masking.

Everybody remembers a student who forgets her line when reading a poem from her memory in primary school. Excitement, strong feelings cause memory retrieval failures also. In this situation, concentration
is not the culprit. Concentration is required and obtained. The required mental resources are ready. What is the thing that makes the child forget while reading the poem from her memory?

Another similar situation can be observed when you are walking down the apartment stairs. If you look at each step and each stair you step on, you tumble□ If you get excited and afraid you get stiff your muscles harden. If you 'let it go', 'let it lose' a little bit and walk with confidence (to something out of your control) you walk down the stairs easily□

If you concentrate too much, more than necessary and increase the stiffness of your posture, you increase your brain's cognitive section's control. On the other hand, remembering requires the functioning of your subconscious. You do not remember things with using your logic. You give hints, keys and then your subconscious finds and brings them to your conscious. Remembering requires a fine balance between conscious and subconscious entities. So, the primary school student who stiffens and gets excited does not give a chance to her subconscious to retrieve the lines. She fails.

Tonus - posture, In fact, there is more to the problem than stiffening or hardening the muscles□ Yes, when concentration increases cognitive abilities increase and they use most of the brain resources but how does this happen? How is the balance obtained between different functional parts of the brain? How does a professional theater actor remember thousands of lines without any mistake? What does a pianist learn in many years of education that she does not forget in the concert?

A professional learns to orchestrate his brains functional parts through education and professional practice. Choosing the right thinking speed sets the right timeframes to enable the brain to activate its

right functional part itself. Excessive concentration hurts memory retrieval not only because of the muscle stiffening and hardened posture but also because of the thinking speed cognition reaches. Cognition can reach thinking speeds that feelings use by the help of high concentration. This may hurt the overall functioning of the brain and may be the subconscious (I have a few more words on that for the future articles).

There are many implications of the thinking speed. But, I will note here only, you must select the right timeframe and hence the right thinking speed in order to be successful in any task. Be careful feelings are the fastest processing brain activity, emergency processes(programmed), automatic processes (thinks you do by memorizing) are the second, cognitive processes the third, safety related risk sensing(the slowest). So, next time you lock the door of your house, do not behave as if you are typing on your computer. Last but not the least, the speed of cognition can be controlled by concentration. Some of the emergency processes such as fear etc. are built-in feelings, I indicate learned processes as emergency processes.

It is vital to select the right posture and muscle tonus which will give the correct message to our brain at first. Then one must set the right salience, the right time frame and thinking speed and then increase the concentration to the required level, nothing more nothing less One can set himself the right mood to do a task by using his education and PERSONALITY. Each person is a different solution and each profession requires a specific mental set of human mind.

<title>Short Notes from Conflict and Cogntive Control in the Brain</title>

Short Notes for Interested People from

Conflict and Cogntive Control in the brain
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ABSTRACTRecent research from cognitive psychology and cognitive neuroscience has suggested that the control mechanisms by which people are able to regulate task performance can be dissociated into evaluative and executive components. One process, implemented in the anterior cingulate cortex of the brain, monitors the amount of conflict that occurs during information processing; another process, implemented in the dorsolateral prefrontal cortex, is involved with maintaining the requirements of the task at hand and with biasing information processing in favor of appropriate responses.
...
Whenever one performs a task, one has to make sure that one selects the relevant information (stimuli, actions) and not get distracted by stimuli or thoughts that are irrelevant to the task. Such distraction might lead to inappropriate actions, such as errors. How the brain manages to do this is the central question in this paper: specifically, how people manage to pay more attention after they have either made an error or almost made an error.

One of the key aspects of cognitive control is how flexible it is. The issue of how people monitor and correct for errors has become a popular topic of inquiry in cognitive research;
...
ATTENTIONAL CONTROL AND THE PREFRONTAL CORTEX
Many phenomena from cognitive and social psychology are thought to depend on automatic processes. Processes can be automatic when they are innate or highly practiced, because they are part of a strongly activated schema, or because they are imposed by a powerful social context or a strong motivational or emotional state, among other reasons.

However, when the irrelevant, automatically processed information is associated with an inappropriate response, the resulting conflict between appropriate and inappropriate responses might be difficult to overcome.
...
This is thought to occur because word reading is relatively more automatic than color naming; therefore the word is hard to ignore, and it activates the associated response. During incongruent trials, the responses associated with the color compete with those associated with the word. When conflicts occur, attentional control is needed to overcome the conflict by selecting the relevant information and suppressing the processing of irrelevant information. Control is often conceptualized as the ability to represent and maintain the task requirements, to support the processing of information relevant to the goals of the current task, and to suppress irrelevant information. Many neuropsychological and neuroimaging studies have shown that an important brain structure that supports this ability is the prefrontal cortex (PFC).
...
The PFC is also involved in the control of other forms of higher-order cognition. For instance, many neurophysiological and neuroimaging studies have shown that this region is able to maintain task-relevant information for brief periods of time, which has supported the notion that this region constitutes a neural basis for working memory. Also, the PFC is involved in task preparation and switching between different tasks. Therefore, it is thought to be involved in many aspects of the executive control over our thoughts and actions.
...
PERFORMANCE MONITORING
The notion that control regulates other types of information processing begs the question, how is control itself regulated? Without a clear answer to this question, the notion of attentional control becomes homuncular, posing the same questions as it is supposed to answer. Therefore, an answer to this question is fundamental to understanding the flexible nature of attentional control.

We and other researchers have argued that the role of detecting situations in which there are conflicts within the information-processing stream and which therefore require attention to be resolved
...
This activation of the incorrect response is followed by activation of the correct response. If the initial incorrect activation does not manage to reach response threshold and the correct response manages to override the incorrect response, the response to the trial ends up being correct. Errors in speeded-response tasks are typically fast, impulsive responses based on incomplete stimulus evaluation. The timing of response activation during error trials does not differ much from that during correct trials, the

main exception being that during error trials the initial activation of the incorrect response does reach response threshold. The subsequent activation of the correct response is manifested as the tendency to ''correct'' the error
...
FUTURE DIRECTIONS
Many studies, including subliminal-priming studies, have suggested that conflict can occur in the absence of awareness; however, studies have not been conclusive as to whether this conflict also engages the ACC or whether such conflict is associated with a subsequent increase in attention.
...
Similarly, these areas have also been suggested to play a role in cognitive dissonance; Harmon-Jones (2004) has hypothesized that the ACC detects conflicts (dissonance) between actions and attitudes and alerts the PFC to reduce this dissonance.

<title>TO TRANSCEND THE GLASS</title>

Many times that I have stood in front of a toy seller's shop, had this small boy in me wished to transcend the glass shield and reach out to one of the toys on the display. Although light can pass through the glass we can not. This feeling that you feel against the seperating property of a shield of glass, the feeling of powerlessness because of the inability to reach something you yearn for hurts me deeply. On the other hand, one should not reach out to the things he is not able to catch says our parents.

As the years pass by, notices one that our lives are divided with glass shields, a compartment next to another Sometimes there exists nothing, not even a glass shield between. Somebody new born to this system of life does not notice these 'glass' compartments in the beginning, only till he tries to reach something he does not deserve

To speak is a privelege of this type. When you look around everybody talks. It's just as simple as happening by itself without any effort But, when it is up to you to speak to a foreigner, to a teacher, to a supervisor or to one of your students or a farmer, just try and see what happens One notices that it is not as simple as it looks to speak to others, just like does a small kid who tries to reach something higher than his own height

Imagine a child aged around two years old! He can understand what's going on around him. He keeps track of every close thing . He is even aware that he is a seperate being which owns its own life. But he cannot speak An unseen shield of glass stops his voice to be heard when tries to speak He is aware that he has a voice. He does not know what he cannot do. He tries to reach out to and touch things that only his words could touch. He fails. He does not succeed because there is an unseen transparent thing between. Indeed he tries to find what that is. At the end, he does find it. A few words come out of his mouth. Something like mom, dad The foundations of the structure which have been laid underneath will help him stand up for the rest of his life. This is the name of the thing that stands between him and others: SELF.

Each person who succeeds to speak lives similar difficulties a couple of more times in their life. The most striking example of these situations is learning the first foreign language. Specially if one goes to a country of which language he does not know well and learns it slowly day by day like a small kid, this situation becomes quiet similar to the process in his very childhood. Psychological problems that may appear in people living abroad may have substantial relation with this phenomenon. If scrutinized, schizophrenia and other similar problems have some roots in this difficult period of life around 2 years old.

Many have English as a second language in Turkey. Unfortunately, as one of my visiting European colleagues has mentioned 'Everybody speaks Turkish in Turkey, but all does so badly.' Hence we are a society who can speak the second language not so good. OK, what happens if one tries to learn the 3rd and even 4th languages as many do in Europe? Unfortunately, the number of people who knows this, who has tried and succeeded are very few in Turkey compared to key European countries. When pushed to learn the 3rd language your second language begins to waver, you begin to forget some words etc When pushing the 4th language the grammar difficulties in every language including your mother tongue may appear You forget words, or mix languages using French words in English etc. Even worse is,you think you are speaking your native tongue when speaking an other language, your students although benefiting from this, politely make fun of it. The worst, because of not knowing which language to listen while passing people are speaking on the street you may think some Germans are speaking quiet good Turkish. The rest of your life, you hear French, German, English words in the noise that you hear

Foreign language education is a strategically important subject in our country. Around our country lies Greek, Bulgarian, Serbian and other ex-Yuogoslavian, Romenic, Hungarian, Russian, Ukranian, Moldovian, Checnic, and other ex-Russian, Armenian, Persian, Arabic speaking countries. From the European perspective we have to count English, French, German, Italian and Spanish to name a few Turkey can succeed against this great challenge by only good organization, planning and specialization, not by acts of good luck.

The complexity of the Turkish geography surrounded with oceans has created the obligation of a closed culture in a single umbrella language and culture. The physical largeness and the neessity to keep everything in order has caused the development of practices that may not be in parallel with Europe for many centuries

Turkey tries to improve her relations with the European Union primarily for economical obligations. But similar to the child learning to speak for the first time Turkey has communication difficulties with Europe. The struggle to express her own concerns and convince her counterparts to give her deserved rights, is driving Turkey to redefine and find herself anew in the 21st century world. When mixed with the effort to reown her own culture coming from the past, the effort to transcend the invisible glass between Europe and Turkey, pushes the Turkish society to the limits of her cultural and sipiritual strengths. An adventure initiated by economical obligations is having much wider and unforeseen effects on our society driving her to the limits of healthy development.

<title>The Role of Volition in Emergency Response</title>

The response to an emergency situation may be pressing a brake of a vehicle. Or it may be a complex situation that has to be managed via Cognitive strategies, such as, tolerating uncertainty, managing workload, planning for contingencies, and self-monitoring (Kontogiannis,1999). Emergency response may require the collective effort of a team controlling a dynamic complex system such as an electric or nuclear reactor.

The simplest response of an operator is a well memorized schemata, such as pressing the brake. He does not think about how to press it, this reaction to an emergency is an automatic process. Many drivers do not even remember how they managed to stop and escape from danger in serious accident conditions. They reacted with automatic processes which do not run in the working memory (Baars et al., 2007).

all mental events are initiated and developed unconsciously. Indeed most mental events are probably completely unconscious(see Velmans, 1991). The chief difference between conscious and unconscious events could be the duration of the processes giving rise to them. If the duration is too brief, the event remains unconscious; it only reaches the awareness level if the duration is sufficiently long (Libet, 2006).

This means, the faster we do things the more automatic processes we use. When we are doing something if an other thing interferes we try to continue the first job automatically. At first we may continue with attention division, doing two tasks with some attention dedicated to both. If the workload of the second task increases we try to continue the first task with automatic processes, namely using resources out of the working memory.

Automatic processes are fast but not flexible as conscious processes. Pressing the brake is simple, fast and does not require elaboration. Things get more complex when the duration and variety of reactions that make up the emergency response increase. For example, the situation of the road, other cars etc. In any case, a series of automatic processes may have to get mixed with conscious decision etc

My point of this complete notedepends on:
Emergency response not only requires the execution of automatic processes but also their timely triggering, which has to be automatic.

Automatic triggering of events in the mind is done by setting intentions such as : if this happens, do that. There is a condition what to do if that condition is realized. This condition can be anything, time, place, event, feeling For example, you can teach a child not to cry when she falls down.

Automatic triggering of events in the mind is simple teaching, training in the most general sense. More specificly, it is conditioning. You condition the operator, to react specificly under specific conditions.

The problem is: the training cases have to be limited in content and not too complex, because they have to be responded automatically. It is impossible to cover every and each condition that may happen in an emergency case. Automatic processes can not be flexible and adaptive.
Automatic process triggering can be viewed as a specialized memory process. Remembering something requires cues, keys to retrieve data. An automatic process triggering condition is the key to its action. For example, you set the intention that you will remember to buy bread when you come to the corner of your home's street, then afterwards, you remember it when you come to the corner(Eysenck et al., 1996), provided that your workload and motivation and mental health enables it.

Last but not the least, It is crucial to foster and underpin an other form of volition in regards to this problem:motivation. Motivation supports and sustains every and each cognitive activity. It supports human creativity, serenity, drive anything that may help the operator in trouble. Cognitive flexibility depends on the availability of sufficient motivation.

A due reference to various religious practices may be: fasting which is supposed to be automatic, begins with setting intention. It is done with the first pronoun 'I' and using reflective consciousness. It is interesting that human uses self while promising that self is going to abide by the rule when consciously it will not be there

The beauty of the human mind.

Ali R+ SARAL

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Eysenck, M. W., Keane M. T. 1996, Cognitive Psychology

<title>TRIGGING MECHANISMS IN DECISION MAKING</title>

Abstract: CHRISTOPHER D. WICKENS has written an article titled 'Multiple resources and performance prediction' at University of Illinois at Urbana-Champaign, Institute of Aviation Willard Airport, Aviation Human Factors Division, Aviation Research Laboratory. This article proposes a model to predict human performance under conditions that require multiple mental resources. I will make use of the information provided in Wickens's article to point at the importance of trigging in human cognition.

To my fellow Turkish aviator Mr. Servet BAŞOL,

A trigger is a simple, high affordance, easy to use mechanism. You should not think elaborate things to make it work. Its implementation should be independent from the logic of the system it starts. Starting the system must be totally insulated from the decision making. It should work as simple as a Texas cowboy firing his gun.

Our brain does multiprocessing, multitasking and distributed processing. We can talk and walk at the same time. We can talk to two different persons on different subjects in the same time interval. MRI pictures show that different parts of our brains get activated for different types of tasks. We perform these tasks using various resources of our minds.

The multiple resource model proposes that there are four important categorical and dichotomous dimensions that account for variance in time-sharing performance. That is, each dimension has two discrete 'levels'. All other things being equal (i.e. equal resource demand or single task difficulty), two tasks that both demand one level of a given dimension (e.g. two tasks demanding visual perception) will interfere with each other more than two tasks that demand separate levels on the dimension (e.g. one visual, one auditory task). The four dimensions, shown schematically in figure 1, and described in greater detail in the following pages, are processing stages, perceptual modalities, visual channels, and processing codes. Consistent with the theoretical context of multiple resources, all of these dichotomies can be associated with distinct physiological mechanisms.

img id="BLOGGER_PHOTO_ID_5170612049019434146"
Wickens's model has been supported by many MRI works that study the brain locations activated by specific tasks. Unfortunately many mental tasks are complex. For ex. speech activates many parts of the brain at the same time. This makes it extremely difficult to drive some generalizations in regards to the character of these activated brain locations. Simply it is difficult to claim that there are simple, straight forward, seperate, 'processors' or even 'centers'. Wickens's aproach and 'resources' model serves its purpose without making unproved generalisations.

But, Wickens also states: In employing multiple resource theory to guide such dichotomous categorical design decisions, it is of course important to bear in mind the other consequences of switching from one resource category to another, such as, for example, the fact that a visual-spatial map may be a more compatible means of delivering geographical information than via words. Wickens's statement points at the overload that arises because of changing the modality during task performance, namely driving a car and navigating at the same time. Wickens clearly assumes the existence of some sort of a trigging mechanism, which triggers an other modality with some mental performance cost.

Today, we certainly know that there are many neural networks in our brains. There are also connections between dedicated neural networks. My point is: Wickens's 'resources' are triggable with some sort of trigging mechanisms, possibly hard and/or soft. Moreover believes this humble dreamer, mental triggers are ubiquitous. We can observe them beginning from low level physiological structures going up to skills, hobbies, professions, habits.

Trigging mechanisms can be built in many different ways. Seeing objects, images trigger our brain's visual resources, hearing sounds triggers hearing resources Visual and acoustic signals are recieved by different organs and this provides a hardware connection and filtering mechanism.

But it is not that simple. The sound and visual signals also have different data characteristics. The frequency bands for sound and image are different. It is not only the organs and physical connections that triggers our brain's visual and acoustic centers but also the character, the format of the sound and the image signals.

It is amazing, how brain transforms and processes signals of different modalities such as sound and image. The signals loss their perception formats when they are taken into the working memory as semantic chunks How does the central processor decide which processor to trig for which signal then?

There must be some encoding algoritm, maybe only the amount of data or the SPEED. The way the data is provided and processed could trigger the related processor. A neural network could simply work as an RC filter circuit besides its logical function and filter acoustic or visual signals as high or low pass filters, maybe.
Within a certain modality, content adrressing triggers related items at different semantic levels. For ex., when you see me, it triggers your previous impressions about me.

Trigging does not function linearly either. Same events do not trigger same reactions in our brain under all conditions. Anticipation, priming, mood, motivation, context and memory usage affects trigging mechanisms of our brain.

My second point is: Trigging is a vital element of our mental life both socially and individually Sadly trigging can be used by people with bad intentions such as the assassination in the beginning of the first WW. On the other hand it is a rich human resource that can not be overused. Emergency psychology, decision making under stress, large systems, aviation, air traffic control have many applications for it. Slow progressing processes such as education, politics etc. also

A trigger mechanism reduces flexibility but increases automacity when designed correctly. It brings a level of abstraction. There are different types of mental triggers: For remembering things, you could say 'I will remember this tonight', or 'I will wake up 6 O'Clock in the morning', 'I will stop thinking about my job when I come to the stairs of my house, till I begin to drink my coffee after my dinner, I may remember it if necessary'
It looks like the religious commitments that one makes before fasting etc

Reaction triggers could be 'I will push the brake to the bottom when it is inevitable', but this should rather be a warmth in your right leg muscle rather than words Sports is all about doing the right triggering.

Finally, cognition, a healthy mental life requires the development and maintenance of personal triggering mechanisms. Emergency processing, analysis, smalltalk, imagination, design, planning,

mindfullness, high concentration, high concentration long duration working, recovering emotions after heavy cognitive work Staying healthy as a successful professional requires maintenance and enhancement of your mental triggering processes so that you sustain your well-being.

<title>EMBODIMENT AND MAN - MACHINE INTERACTION</title>

To my kind colleague Herr EHRENBERGER
who drew my attention to the importance of HCI
after viewing an airplane accident replay
at Karlsrue Upper Info Control Center in 1992;

Through our bodies we reach other people and the world. To speak with others, to help others, to work, to create, to love we use our bodies. We exist with our bodies. We feel our existance through our bodies

Behind your thoughts and feelings, my brother, stands a mighty commander, an unknown sage - he is called Self. He lives in your body, he is your body. (Nietzsche, 1883, 'Thus Spoke Zarathustra' from Learning Space - OpenLearn - The Open University).

We know our body by its abilities. We can turn our hand, open it, make it a fist, move our fingers one by one etc. We can also feel every movement our hand does if we listen it. We can feel it as a whole or its parts seperately...

If a human has a hand, he or she feels more or less the same abilities with his hand and similar basic feelings But was the hand of Rembrandt the same as mine? Was the relation of Rembrandt's hand with his mind the same as mine? Merlau-Ponty has written I do not simply possess a body; I am my body in 'Phenomenology of Perception'. Rembrandt's hand was not simply a hand, it was Rembrandt the painter's hand It was Rembrandt the painter himself.

Phenomenological theorists distinguish between the subjective body(as lived and experienced) and the objective body (as observed and scientifically investigated). My lived body is an EMBODIED CONSCIOUSNESS which fluidly and pre-reflectively engages the world. As we engage in our daily activities, we tend not to be conscious of our bodies and we take them granted - body that is passed-by-in-silence (Jean-Paul SARTRE, 1943, Being and Nothingness).

Embodiment is the process or state of living in a body. All embodiments do not need to be the embodiment of living things An existing thing can have a body and thus can be an embodiment of an identity that can be identified For example, water is the embodiment of all the things that identify water. An aeroplane is an embodiment of everything that identifies it; it flies, carries goods, can stand difficult climate conditions, it has a speed, it carries an accumulation of expertise and experience, it has a history, it materializes the ambitions of many individuals both in the past and today

All embodiments do not need to be simple or single embodiments There can be composite embodiments in the world. Composite embodiments can and do exist. Composite embodiments form when simple embodiments of things mix and act together with a new and single identity, all interacting with each other and as a virtual self

In 1996 I listened a piano concert at Darmstadt. The program was composed of a group of extremely difficult works by a single composer. The performer was not a single pianist as usual The pianist was embodied by two seperate and different pianists They had prepared collectively for this concert and played the series of pieces one by one in sequence. The pianist whose turn passes listened the other pianist performing.
Having prepared together gave them the ability to perform as if there is a single performer, with his single identity, feeling and so on Using complex embodiment gave the two pianists the ability to do the impossible and achieve the extremely difficult.

Embodiment has the gift that enables us to achieve the impossible or extremely difficult things and create new things. A person holding a hammer is a composite embodiment. A hammer and a person are seperate embodiments. A hammer holding man is a different and composite embodiment Moreover, the person that holds the hammer experiences knocking the nail as if the hammer is a part of his body himself Because, he is aware that he is knocking the nail with the hammer He is hammer using man He is the embodiment of consciousness defined and required by nail knocking activity indicated by the affordance of the hammer.

Embodiment is the process or state of living in a body Some of the composite embodiments form when we use a tool. Prothestic devices stretch the boundaries of the body. They create a continuity beyond the limits of the skin(Carolien HERMANS, 2002, Embodiment: the flesh and bones of my body). A body schema works on a subconscious level. It registers shape and posture of the body(without coming to awareness). It makes a record of the momentary relative disposition of one's own body parts. Prothestic devices can be absorbed in the body schema. Just as a hammer in the carpenter's hand is incorporated into his body schema, any virtual body part or interface(keyboard, mouse, joystick) can become part of the schema in a temporary or longlasting way

"The driving of a car. We are intimately aware of how a particular car's gearshift needs to be treated, its ability to turn, accelerate, brake etc, and importantly, also of the dimensions of the vehicle. When we reflect on our own parking, it is remarkable that there are so few little bumps considering how many times we are actually forced to come very close. The car is absorbed into our body schema with almost the same precision that we have regarding our own spatiality. It becomes an "area of sensitivity" which extends "the scope and active radius of the touch" (Merleau-Ponty, Maurice (1962). Phenomenology of Perception. C. Smith (translator). Routledge & Kegan Paul.) and rather than thinking about the car, it is more accurate to suggest that we think from the point of view of the car, and consequently also perceive our environment in a different way".(Reynolds, Jack (2002). Merleau-Ponty. Amsterdam: internet.)

Going back to the hammer example The person holding the hammer does not feel he is holding it when he is knocking. The subjective body of the composite identity focuses on the knocking process. Holding

the hammer is not very different from moving his arm and using his muscles to produce force. The hammer has become part of the body schema of the nail knocking man. If something wrong happens and this process is interrupted, then the nail knocking man becomes aware of the hammer that he is holding and changes its direction etc. The hammer becomes the objective self of the nail knocking man.

My questions are: what happens when an accident happens while a human uses a tool, device or vehicle? What happens when an executive air traffic controller is over-loaded? What is the effect of stress on the embodiment of a large system operator like a nuclear reactor? What are the psychological effects of a complex software development tool such as Rational on a large systems software developer who has to work one year on the same difficult project?

Let's think of a race car driver. He studies the race road before the race. During the race he must maximize his speed at every and each turn or straight part of the road. He tries to adjust and catch the max speed according to the road piece he faces and the status of his car. Actually it is the road and the car that orders him to change the gear and press the gas pedal as such. The driver has the ability to set the initial and previous conditions of the car, his choices determine the past and the cumulative effect of the past determine his effectiveness on the future. This intertwining can be seen in simple holding hands also:

"If I touch with my left hand my right hand while it touches an object, the right hand object is not the right hand touching: the first is an intertwining of bones, muscles and flesh bearing down on a point in space, the second traverses space as a rocket in order to discover the exterior object in its place" (Merleau-Ponty, Maurice (1962)

If the driver forgets himself and begins to act only according to the messages he gets from the road, this may cause disaster. If the driving man identity is lost and the car which has become part of the man's body schema takes over the control, the driver enters a turn with a speed which may be impossible for the car.
Forgetting the abilities of the system or misinterpretting them is also explained as a 'mental model' mistake which leads to an accident. Embodiment can explain accidents better as it provides more on the psychology of the operator and the intertwining between the environment and him.

Accidents happen because of anomalies in the embodiment of complex identities. A mistake in the embodiment of the car, and the human, such as a failing tire or a physical anomaly of the human(alcohol) will cause an accident. If the complex identity, the driver becomes too dominant, such as the drive to achieve a goal as a driver, and causes the abilities of the car and the driver as seperate embodiments to be forgotten, also accidents happen. Mistaking identities or losing, forgetting them causes the failure of the complex identity.
The successful operator is the one who can find the ultimum balance between the identities of the complex embodiment, namely the simple selves and the complex itself with in the prenoetic limits.

Driving a car or operating any system requires the operator to arrange his priorities. His priorities to take care of the simple embodiments as the car, its status, gas, oil etc. As the human being, tiredness, sleep, etc. as the complex embodiment, the driver, cruising speed, road status, possible obstacles etc..

Driver, the complex embodiment has to create a special consciousness to be successful. This consciousness has to be subjective. You can not do all of these continiously with full concentration.

If we go back once more to SARTRE;
"Phenomenological theorists distinguish between the subjective body(as lived and experienced) and the objective body (as observed and scientifically investigated). My lived body is an EMBODIED CONSCIOUSNESS which fluidly and pre-reflectively engages the world. As we engage in our daily activities, we tend not to be conscious of our bodies and we take them granted - body that is passed-by-in-silence (Jean-Paul SARTRE, 1943, Being and Nothingness)".

The danger in this is, our bodies have the tendency to execute their body schemas, namely to exist, subjectively. We try to do things automatically after we repeat them for a while. An experienced driver tends to do things automatically and forgets the rules after a while.

Hence a safety related systems operator such as an air traffic controller or a pilot, must rise above its complex identity as an embodied consciousness of the human and the system and foster a special awareness of things existing around in the cockpit or the control board. This is called situation awareness by a few 'mortals'.

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<title>WHAT IS GOING ON IN THE TURKISH AIRSPACE?</title>

This summer flights to Istanbul and Antalya had delays of around one hour. My sister's airplane had to wait one hour at London Heathrow airport the motors working. Luckily, EUROCONTROL's air traffic flow management center at Brussels keeps airplanes on the ground till there is a window of safe opportunity in the traffic.

What went wrong and why does the Turkish air traffic system can not handle heavy traffic loads? Is it safe to fly to Turkey during the heavy season, namely the June, July, August and the new year, Christmas season?
Is it safe?

The answers to these questions may be found in the EUROCONTROL Experimental Center's Report No: 396. "In 2003 the Turkish ANS Service Provider DHMI (Devlet Hava Meydanlari Isletmesi) requested assistance from EUROCONTROL for a series of simulations to analyse the current ATC sectorisation and routeing schemes within the Turkish airspace against forecast traffic growth until 2015 and propose a new sectorisation plan suitable to existing and planned route network". "The simulation study has to provide a survival plan for the existing system until SMART becomes operational, and to provide a revised
sectorisation plan for the new system up to the year 2015". SMART is DHMI's new project which is supposed to replace the current ATC system left from 1980's.

The SMART project bidding was won by the INDRA company last year. But the project was cancelled on the ground that although THOMSON had offered some 30 million Euros more they had also offered a more sophisticated technical system. DHMI cancelled the bidding and made an other this year, around January... This time only two companies entered the bidding process. The bidding was cancelled once more when one of these companies withdrew... No reason was given...

It is impossible to tell every detail of EEC Report 396 here... You can find it on both EUROCONTROL and DHMI sites or you may request it from me.

The pith of the issue is, EEC report 396 states clearly that the Turkish ATC system, specially Istanbul and Antalya may not be able to respond healtily to the Air Traffic beginning with 2005 - 2010... You can see careful and restrained warnings, such as "Additional sectorisation capability should be made as dynamic as possible to relieve temporary overload".

During this simulation there has been conflicts between the Turkish side and possibly members of the EUROCONTROL simulation theme because:
". Despite the fact that members of the working group have accepted restrictions only with a certain degree of hesitation it must be said that their application lead to the fact that no High or Upp sector is faced with serious problems. Contrary to this are the Ist-Mid-West and the Ank-South-Low sectors which show the highest loadings for this exercise. In Europe, strategic restriction of flight operation is in general use. The safe and orderly handling of the high number of flights could not be possible otherwise. Turkey has a tradition of offering, as far as possible, an unrestricted flight path to the operators. In the future however, in order to cope with the increased traffic demand and to provide a safe service, it will be necessary to consider restrictions with regard to flight levels, routes and times more regularly".

"As traffic grows yearly, solutions will be found gradually and constraints applied if and when necessary. The working group is convinced that useful and intelligent solutions will be tested and applied to assure the safe
and efficient control of the increasing traffic and refrain from making specific suggestions in this area".

". saturation of the Istanbul sectors depend to a large extent on the traffic in and outbound Istanbul. Since no restrictions apply, a flight entering at high level will penetrate all existing sectors during its descent. Departing flights climbing to a high level will also penetrate all sectors. With strategic restrictions the number of flights per sector and hour can be reduced".

The reporter TEWES declares the simulation target as impossible to achieve by:
"Despite that all these results are theoretical ones, they gave good indications and hints to the working group where to start to search for improvements, especially having in mind the traffic forecast for the year
2015. It was evident that the sector plan developed for the 2005 scenario was not able to cope with the traffic demand forecast for 2010."

There certainly are more to say about the report but I will suffice by making a few comparisons with a similar report of a simulation done for Bulgaria...

1-Bulgarians used both military and civil data in their simulations.
2-Bulgarians used only August data where as Turkish data is dispersed two different times of the year.
3-Bulgarian report indicates the names of the Bulgarian ATC personnel. The Turkish reports do not indicate any individual who would take conciencious responsibility.
4-Signs by comparison indicate that the DHMI system has discrepencies in Planning Controller and Radar Controller functionalities.
5-Signs by comparison indicate that the DHMI system is a system left from 1980's which does not have automatic strip printing.

By the way, strips are the last resort of air traffic controllers when the radar picture is lost...

Safety is a feeling at the personal level. I fully understand that you choose or not to fly over Istanbul under these conditions at specific times...

But, safety has also a technically established universal definition that is assigned to a meaning. No air traffic controller should claim his skill to be over his vigilance...

Ali R+ SARAL
Note: Any specific question is wellcome. I have a very detailed analysis of this report and what may have gone wrong there.

<title>VERTIGO IN THE CONTROL ROOM</title>

This is the second of my four articles serie on FALSE SENSE OF SAFETY in the Air Traffic Control systems. The results and advices however not solid,may be considered valid for many large systems,such as nuclear energy reactors, railwaytransport systems etc...

The hardcore large systems guys may considerthese unnecessary or invalid but the developments in the psychology and neurologyin the last ten years have made the oldbooks out-of-date. Even these developmentsalone are precursory to discussthese issues, however subjective or notsolidly founded. The high rate ofmental diseases among people working in the large systems can not be and should not behidden any more... Also, finding thereasons for these mental breakdowns etc...may give us the

chance to build evenmore complex systems. We are buildingcomplex systems that can not be controlledhealthily, namely the operator's health andthe mission's healthy success.

In this article, I will compare an internet article named "Night Operations"'s "Disorientation" section with an Air TrafficControl System's safety situation. I willmake a few references to the Swiss ATC accidentthat caused 45 Ukranian chieldren's death also.

"Disorientation, or vertigo, is actually a stateof temporary spatial confusion resulting frommisleading information sent to the brain by various sensory organs."

Every guy, and also the operational responsibleperson in an ATC system assumes that an accidentis inevitable. The technical stuff tries to improve the system so that the possible date ofthis inevitable accident is postponed into thefuture. So, the direction is the directionof the movement of a possible accident on thetime domain.

How can a disorientation happen in the mindsof technical stuff in an ATC system?Just like it happened in Switzerland.It was night, the most appropriate time todo technical changes. Apparently, there weretechnical maintenances on the system. Theoperational management, had considered thatthe changes they made and the operation itselfwould push the inevitable accident a way... But the fact was, telephones not working, short term conflict alert not working on the radar,etc...The operational managementwas fully disoriented...

An accident does not happen easily in a largesystem. There was also an other disorientationin the systems design of conflict alert of the airplane systems. They were designed tohelp the pilots but practically the procedureswere not clear on how to use it. The pilotsgot totally disoriented and one of them acted according to the advise of the controller notto the instrument, which is a typical vertigomistake. The pilot, although died, had actedright according to the rules. The real vertigowas in the minds of the Swiss operational managers.

"The most difficult adjustment that you must make as you acquire flying skill is a willingnessto believe that, under certain condition, yoursenses can be wrong." The fact is many largesystems were state owned and have recently beenprivatized. There is a strong hierarchy inthese organisations. Unfortunately,hierarchy not only gives the operational management the power to make singular individual decisions but also may slow down the information flow coming from the engineers working on the maintenance and enhancement floor.Even Lars Fredholm, from Swedish FireDepartment states "the problem concerns thecapacity to make co-ordinated decision atdifferent levels of the management. In astatic situation you have time to follow thesequence planning, executing, evaluating.In a dynamic situation the sequence is disturbedby the dynamics of emergency. The co-ordination of the decision making at different levels ofmanagement has to be more dynamic and flexible."Report 3111, Lund 1999... That night,the Swiss operation's management was in a dynamicsituation, I believe, according to myexperience at Karlsruhe UIR.

"If the rate of directional change is quitesmall - and not confirmed by eyes - the changewill be virtually on detectable and you willprobably will not sense any motion or whatsoever."When many successive

changes are realizedsuccessfully, a sense of false safety forms.Things are going well, we did this, let's addthis modification also... Without reallyevaluating the possibility of falling into a situation where the system fails and must returnback to the backups where not all the modifications may have been done. Moreimportant, the current controller stuff may havedifficulty to remember which version has whichnew functions etc...

"Here's where trouble begins! Inside the airplane,if you are unable to see the ground and establishvisual reference you are just seconds awayfom the famous graveyard spiral."The writer from helicfi.com tells the solution.There must be reference points... There must bemetrics values carefully and insistingly usedin an ATC system. 10 years ago, at Karlsruhe,we only head retrospective reliability measures.In other words, how long the system has workedin the last year, for how long without interruptionit has worked. Nothing prospective... There must be measures as used in spaceshuttle andaerospace companies... to predict possibleproblems... It is a shame if an ATC centeris still not using these measures. I willwrite my next article on this matter whichcould have saved the lives of the Ukranian chieldren.

Metrics values about the ongoing maintenanceand enhancement activities, even the performanceof the controlling and technical personnel cangive a strong indication, and may be the AWARENESSthat could help the operational managementto rise out of their FALSE SENSE OF REALITY,when things seem to be going on routinemanners, in the "automatic processing" of theATC systems using pre-scheduled "schemata"...

Pity.

Ali R+ SARAL

<title>MISTAKES ARE BEAUTIFUL</title>

Mistakes are beautiful. Because they introduce a touch of reality to the perfect beauty. They make flawlessness breathe. I have written this article originally for my Turkish fellow citizens. I learned this adage from a conversation at BBC Prime. I believe mistakes are beautiful everywhere on the earth. But please excuse my verbosity for my heartfelt urge to speak out for the benefit of my country's sensuous people. My word stands primarily for them.

A player has to pass through some furniture on the stage and run to the front Unfortunately, an other player hits a chair and the first player's running way is closed. What would a master player do in this situation? What would you yourself do in this situation?

According to the character of the play, a master player chooses to: 1- 'Oh, God would this happen to me also?', if the play is a serious one such as a tragedy. 2- 'Haha, only this was missing on my way!', if the play is a comedy. In the mean time, somebody would rempve the chair from his way.

An experienced performer or artist makes the best out of the unexpected and sometime unwelcome ingredients he meets during his creative process.

A master performance artist, a violonist, shows his skill when he makes a glitch. He uses this slip as a touch of naturalness or may be as a little spicing and converts it to a natural element of her performance.

Isn't it the same in our daily lives? The more we accept as natural, the mishaps or mistakes we encounter and manage them to our purpose, don't we get the less hurt and be successful?

Mistakes are beautiful. Because they introduce a touch of reality to the perfect beauty. They make flawlessness breathe.

If mistakes are beautiful, then are errors also beautiful?

Hmm, I am not sure. Because as a result of an error somebody gets hurt, or irrecoverable loses may occur sometimes. But this does not mean that, we should live without making any errors. Is it possible not to make any mistakes? If you have done a mistake you pay or make up for its consequences and you continue. Even if you are punished heavily, sometimes some errors may end up with good or beautiful consequences.

Adam and Eve's story from the Hollybooks tell this gracefully. After Adam and Eve eat the apple, they Pay the cost of this error by being thrown out of the paradise. Just think, when viewed from the point of its consequences, aren't the Holly Books giving the message, that not only the mistakes but even the errors may end up happily at the end of the day?

One should not forget discrepancies. If somebody's discrepancy or misjudgings have caused the failure of a task, this is the deficiency of that person. One other meaning of deficiency is: a part or element of a finished work which does not comply with generally accepted rules or is not percieved good according to the established appreciation habits.

The role of mistakes and discrepancies in creativity can hardly be ignored. Mozart and many other genius artists' works are full of 'discrepancies' or mistakes that do not abide by the rules that are thought at schools. If a creator does not make mistakes, and apply only the rules written in the theory books, then he can not create original works. It is not the fact that you have made a mistake, but the way you correct it. How you make that mistake meaningful in such a way that it does not hurt your personality It is being able. Being able to make a mistake...

Forget about the fear of making a mistake or doing something that will not abide by the principles of your way of doing things. Instead welcome every error and mistake with joy. Wonder what is the thing that has caused you or opponent do this mistake. What can you do with this information? How can you update your point of view and how can you say and do more effective things? Wonder how can you make up for this error and more important make it meaningful?

I wonder, how can a mistake be made more beautiful?

Note: A company, any institution or society has to define what is discrepancy, what is mistake or error without any hesitation in order to be successful.

<title>THE FEAR OF DARKNESS IN MY CHILDHOOD</title>

I was three or four years old. My 'baba' (papa) was a military chief at Mardin Nusaybin (Syria border, southeast Turkey). Our Home was the only one built with cement in Nusaybin. It was located outside the village at the top of a small hill. Nusaybin did not have electricity at that time. My mother was a little bit nervous because of my father's duties. My 'baba' had to go out to catch smugglers at nights. A deep darkness would sink over our Home those times Sometimes would burials take place in the cemetery at distance right in front of our Home Night burials, according to the local customs. I used to watch them secretly my hair rising The groups walking in the darkness, candle lights, the dead being carried lying over ladders Not really understanding what was going on

Six months later my mother's efforts succeeded. My father gave up his carrier. He applied for his well deserved retirement. We bought a new house at one of the then suburps of Istanbul. Our new Home had a large garden. We used to have nice evenings at the front-garden in hot summer nights. I remember, every now and then, my father used to send me to the back-garden to fetch some stuff during these night leisures. I was 'damn' afraid of going to the back-garden in darkness. Everybody would burst out into laughter and make fun of the situation rather than me and we would have a sweet time in the family about a small secret that belonged to us all.

Although the fear of darkness in my childhood decreased gradually, it followed me for many years. It transformed into a sensitivity and sense of prudence through time. I wonder, if I had not lived the experiences in Nusaybin at the ages of three to four, would I have a fear of darkness? I do not think so. I would not Nevertheless, many people get nervous about darkness or fear from it. For many justifiable reasons.

OK then, what is the thing that makes darkness such a source of fear? Why is darkness fearsome? Is darkness the fearsome thing itself or is it something in ourselves that makes us afraid?
Is this secret thing located there in the darkness or is it somewhere else? Really, why do we think that something we can not see is located in the darkness, rather than somewhere else for example under the street lamp?

The reason that makes us nervous about darkness is it is not something we could hold in our hands, it is not an absolute object. Just like time Difficult to understand Specially difficult for people younger than age 16, who has not developed a concept about abstraction, yet. Darkness is not an object like a door, a table or a wall. Maybe it is rather something like tiredness or sadness
Its opposite enlightenedness (aydınlık, tr) is rather like happiness, joy In short is darkness a situation and a mood rather than an object.

Darkness is both a phsical situation and our perception of it. If sunlight falls on the furniture in our house our Home is 'enlightened(aydınlık, tr)'. The sun light beams that are reflected from the furniture reach our eyes with enough intensity. But in the evening, the intensity of the sun light decreases. First, some colors begin to lose their liveliness and begin to appear as a shade of grey. Then, they become grey in semi-darkness and disappear in the darkness.

Our interaction with darkness in our modern lives is not the same as in the nature. We move from darkness to light and vice versa suddenly during our daily lives for many times. For example, when the child wishes 'good night' and goes to her room she has to go into darkness first and then open the light suddenly and then close it again Or, when you are driving at night, the cars approaching from the other side of the road dazzle your eyes frequently.

Car, airplane or any vehicle drivers abide the night vision priciples. Airplane pilots' night flying techniques include a different vision technique. In daylight you have to look directly at the target object. At night, you have to look at slightly one side of the target object. Scanning the target by moving your eye permits off-center viewing. You should not look directly at the target object at night unless there is a special reason.

The explanation for this lies in the DUAL STRUCTURE OF OUR EYE'[4]. The cones work in day light and the rods at night. The rods are located on the periphary of a circle around the cones.

The cones need a greater intensity of light to function, and stop working in semidarkness.
The rods can function in 1 / 5000 th of light intensity. The cones are 100000 times sensitive in dark as they are in light. So, they work at night.

The problem is; what do the rods do in the day light? The rods provide a grey scale view, while cones provide coloured Rods lose their sensitivity after short exposure to light. This means less sensitivity is used only for percieving objects in the peripheral view

In short, seeing is not as simple as we naturally presume. Our ability to see changes at different levels of light intensity We can not see with the same quality in all conditions. Our ability to see in darkness is much less than in sun light. If explored, we can easily find that our seeing ability is not limited by only the availability of the sunlight. We have other limits also The views of fast moving seperate things appear to us as if belonging to a single thing moving continuously, for example.

Seeing is not limited with the functions of the eye of course Our brain first percieves then understands the things that our eyes see. We also have some limits in our brain's visual perception naturally We can not percieve the second event if two events happen too quick sequentially They call this perceptional blink sometimes

Our seeing abilities, given by the Creator, require a period of adaptation when the conditions of the environment change, the environment that we are temporarily in. When we move into darkness suddenly, the rod cells in our eyes need some time to get activated. At these instances, give yourself sometime for your brain to get healthy-correct information from your eyes.

During the flow of times, we all experience sudden changes of things we are used to. The problem is not only the change in the conditions that we are accustomed to but also the fact that we, ouselves change. Whether we notice it or not, the way our body and mind work, changes according to the conditions that we are in. A small kid gets red spots on his skin suddenly, a software engineer approaches the end of his project, a pilot lands with his co-pilot in bad climate conditions, or an air traffic controller whose job is to keep airplanes apart from each other loses his radar system which enables him to see the skies

When you fall into sudden darkness, I believe, there may be a few tricks that you may learn and borrow from an air traffic controller who has lost the view of airplanes on his radar. He at least has strips of papers in his hand that shows the locations and directions of his resumed airplanes... If the lights go off when you are on the stairway, you should have kept certain reference points in your mind beforehand, such as the location of the handrail, your relative position in the current floor stairs

Darkness is not an object to be afraid of, it is a sitaution, a mental mood. To cope with darkness, you should have reference points that You have created before. We can not control everything in our lives but 'knowing ourselves' could make us stronger against the difficulties, at least.

Ali Riza SARAL

<span style="font-size:78%;">Note: The inspirational bases of this article lie in:

1. href="http://largesystems-atc.blogspot.com/2008/01/gece-gr-havacilik-iin-eitsel-bir.html" NIGHT VISION: A PEDAGOGICAL METAPHOR FOR AVIATION
href="http://largesystems-atc.blogspot.com/2008/01/night-vision-pedagogical-metaphor-for.html"
2. Chip HEATH and Dan HEATH, MADE TO STICK - the curse of knowledge

3. HOW TO BE A DAMN SEXY MAN- let the kids turn the page
href="http://kristenbrookebeck.blogspot.com/2008/01/how-to-be-damn-sexy-man.html"

4. AVIATION MEDICINE, Night Flight, <a
href="http://www.pilotfriend.com/aeromed/medical/night_vision.htm"
http://www.pilotfriend.com/aeromed/medical/night_vision.htm
Helicopter Flight, href="http://meanwhile.com/?domain=helicfi.com"

Bogdan GAVRUS, Peisaj, href="http://gavrusphoto.blogspot.com/"

<title>The Role of Affections in Decision Making</title>

many forms of decision making, especially those that involve a high level of risk and uncertainty, involve biases and emotions that act at an implicit level[1]. Experiences and conditioning that has been acquired in critical conditions may contribute to the repetitive triggering of previous correct decisions due to the feelings felt in the body or affections at the same time.

Affections make us select the cognitive processses according to the situation that we are in[2]. For example, when things go smoothly and we face no hurdles in the pursuit of our goals, we are likely to rely on our pre-existing knowledge structures and routines, which have served us well in the past. Once things go wrong, however, we abandon this reliance on our usual routines and focus on the specifics at hand to determine what went wrong and what can be done about it. Hence, our actions, and the context in which we pursue them, are represented at a greater level of detail when things go wrong than when things go well (see Wegner & Vallacher, 1986).

Consistent with these conjectures, being in a negative affective state is associated with a narrowed focus of attention (e.g., Broadbent, 1971; Bruner, Matter, & Papanek, 1955; Easterbrook, 1959) and a higher level of spontaneous causal reasoning (e.g., Bohner, Bless, Schwarz, & Strack, 1988), paralleling the observation that failure to obtain a desired outcome shifts attention to a lower level of abstraction (e.g., Wegner & Vallacher, 1986)[2].

Intention is a form of volition. Intention depends on the condition based on time, place, event or other. Intention mechanism can be vitally important to exit or in being unable to exit pre-reflective consciousness in the cases of emrgency or contemplation[3].

the attentional blink has been shown to be modulated by emotional stimuli, as subjects are significantly better at detecting T2 when it is an emotion-laden word (e.g., rape) than when it is a neutral word (Anderson, 2005).[4]

Emotional content can change the formation and recollection of a memory event, consistent with findings in both human and animal studies. Compared to neutral items, humans remember better emotionally arousing information, including emotionally charged stories, film clips, pictures, and words[4].

The French mathematician and philosopher Blaise Pascal once wrote, 'The heart has its reasons which reason knows not of.' This message - that emotion and cognition are separate systems that seldom interact - has a long history in Western philosophy and science. However, the past two decades have seen a remarkable shift in this view as behavioral and neuroscience data have demonstrated that emotion and cognition not only interact, but that their integrative operation is necessary for adaptive functioning[5].

With my wishes of good will.
Ali R+ SARAL

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[3] Ali R+ SARAL, , http://largesystems-atc-en.blogspot.com/2011/04/function-of-volition-in-providing.html
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<title>ABSTRACTION IS GROUPING</title>

SOYUTLAMAK GRUPLAMAKTIR

Miller(1956) has stated that human attention can focus on seven plus/minus two things at the same time.

Miller(1956) insan ilgisinin aynı anda yedi artı/eksi iki şey üzerinde yoğunlaşabileceğini ileri sürdü.

Abstraction enables us to handle more than nine things at the same time. Abstraction reduces things to one of their attributes. This eleveates the burden of handling the unnecessary mental load of treating a whole thing. For example, a ticket seller treats his customers as simple buyers nothing else.

Soyutlama bizeaynı anda dokuzdan daha çok şeyi idare etmemizi sağlar. Soyutlama şeyleri yalnızca bir özelliklerine indirger. Bu bizi şeyin tümünü ele almanın gereksiz yükünden kurtarır. Örneğin, bilet satan kişi müşterilerinin yalnız bilet almasıyla ilgilidir.

Abstraction is grouping. You can reduce five apples and ten peares (of different types) to two by handling them as just apples and peares. You can even reduce that to one by treating them as just fruits.

Soyutlamak gruplamaktır. Çeşitli tipte beş elma ve yine çeşitli on armutu yalnızca elma ve armuta indirgeyebilirsiniz. Hatta tümünü meyva olarak ele alıp tek bir gruba indirgeyebilirsiniz.

<title>When Symbols Fail</title>

When Symbols Fail

"something that stands for or suggests something else by reason of relationship, association, convention, or accidental resemblance(merriam-webster)".

A symbol is an abstraction of a thing, a system, a concept, an idea or a belief.

Computer icons, mental models, metaphors, analogies and SYMBOLs all simplify the task of handling the thing they abstract.

Symbol is a small figure, a simple picture when absolute. A simplifying or delegating behaviour, concept, idea when abstract. A head carve tha symbolizes the belief of a woman for example.

A symbol must be very simple to percieve and be able to trigger the abstract or complex thing it signifies.

When symbols fail:

1. When the symbol fails to indicate the true thing it signifies.

El Al cargo plane loses its motor but the captain thinks else because the motor symbol shows OK in the terrible accident at Amsterdam in the past.

2. The symbol oversimplifies or makes things look more simple then they are.

Simple rules that may help to indicate whether you belong to this or that religion may help people to conform easily but the average quality falls and the basic human facts that make religions are forgotten by some. Systems should be difficult to use, difficult enough to bring forth the operators who are mature and who have the aptitude to think in depth when flexibility is needed.

3. Symbols increase design complexity.

Every absraction done in the design adds on the implementation and maintenance work. It is not a virtue to want this or that everything you imagine at the requirements phase. Increased complexity means increased difficulty hence increased risk. It has to be worth.

4. Symbols reduce flexibility both from the point of useability and design creativity.

Introduction of uncertainity at the beginning of a large system provides ample space for later introduction of new elements or redefinition of them, maythis system be a religious belief or a modern fly-by-wire aircraft.

Kind regards.

Ali R+ SARAL
Ora et Labora

<title>Amygdala, The Repertory of Feelings</title>

By
Ali R+ SARAL - arsaral(at)yahoo.com

Denizde kayıktasınız. Açılmışsınız.
Hava patlıyor. Buna benzer bir
ciddi zorlukla karşılaştığınızda hayatta kalmak için mücadele ederken hiç
İçimde bir his var kurtulmağı başaracağım dediğiniz oldu mu? Hiç bir mantıksal açıklaması olması gerekmeyen. Kelimelerle ifade edilemeyen bu şey, bu his 'güven'dir.

Çocukların duygusal
gelişimi onların çeşitli duyguları nasıl kazandıkları ...[1] 'na
bağlıdır. Bakımın tutarlı olması,
duygusal güvenin korunmasında en önemli bileşkendir[1]. Güven duygusu (bağlılık ile birlikte) insanın ilk öğrendiği duygudur. Bakım, yani
sevgi, beslenme ve diğer ihtiyaçlar bebeğin güven duygusunu koşullanma yolu ile
sağlar.

Pavlov'un koşullama deneyleri
aslında Amygdala'ya belirli bir işaretten sonra belirli bir tepki vermeği
öğretir. Amygdala'sı çıkartılmış ya da
olmayan hayvan ve insanlarla yapılan deneyler işaret verilse bile ilgili
tepkinin denek tarafından verilemediğini göstermiştir[Q1,
Q2].

Amygdala algıların
vücutsal tepkilerle eşleştirildiği beyin parçası ya da alt-organımızdır. Amygdala algıları hissel karşılıkları ile
eşleştirir ve bu eşlemeyi hatırlar.
Örneğin, bir köpek saldırısına uğrayan çocuğun amygdalası, kan
basıncının, kalp atışlarının arttığını, terleme ve panik dürtüsünü bünyesine
kayıt eder. Sonradan bir köpek ile
karşılaşma durumunda çocuk bu hisleri amygdala sayesinde otomatik olarak duyar.

Sinirlendiğiniz zaman
içinde bulunduğunuz durumun farkına varır ve ifade ederseniz 'sinirlenme
duygusu' kaybolur. Çünkü artık
amygdala'nız ve onun sağladığı saklı-implicit hatıralar[Q3] devreden çıkmış, önbeyin - PFC ve Hippocampus'taki
açık-expilicit bellek doğrudan iletişime geçerek kontrolü ele almıştır[Q6,Q7].

İnsan amygdalası
bebeklikten itibaren karşılaştığı bütün durumlara ilişkin hisleri zaman içinde
kayıt eder. Böylece amygdala her olayın
duygusal önemini ve gerektirdiği hissel uyanıklığı-salience içeren bir repertuar
[Q4]oluşturur.

Amygdala dikkat, algılama,
ve açık-expilicit bellek gibi muhakemesel işlevlerin ayarlanması ve değişikliğe
uğratılmasını da yerine getirir[Q5]. Harici uyarıcıların duygusal önemini işleyen
amygdala tarafından bu muhakemesel işlevlerin ayar ve değişime uğratıldığı
genellikle kabul edilir.

Amygdala bağlantıları
bakımından önbeyin-PFC'ye benzer şekilde beynin hemen hemen her kısmı ile temas
halindedir. İnsan yaşamında her eylemin
az ya da çok duygusal bir rengi olduğu ve amygdala ile dikkat[Q8], algılama, bellek gibi muhakemesel yetenekler
arasındaki ilişki düşünülürse(*), zihinsel yüklü ve stresli çalışan kişilerde
affektif-hazsal bozuklukların çok sayıda olması tesadüf değildir[Q9, Q10, Q11].

(*) Aklınızda
tutamadığınız bir şeyi hatırlamak için ona ilişkin ortamı, hissi canlandırmağa
çalışınız. Bu şekilde amygdalanız
hippocampusünüzün arama yeteneklerini arttırır.

. Monkeys without amygdalas have difficulty learning
to associate a light-signal with an electric shock and also have difficulty
associating a neutral stimulus with a food reward. It has been suggested that
the amygdala functions to associate sensation with reward or punishment.[2]

Figure 7: Auditory fear conditioning
paradigm. Studies using this paradigm have helped elaborate the functional role
of amygdala nuclei. Rats are habituated to the chamber on day 1 (no
stimulation). On day 2, the rat receives a small number of training trials
(typically 1-5) in which a tone CS is paired with a footshock US. Controls
receive unpaired presentations of the CS and US. On day 3, the CS is presented
in a novel chamber with a unique odor (peppermint) and fear responses

(freezing) to the CS assessed. Animals receiving pairings on day 2 show high levels of freezing but animals receiving unpaired training show little freezing.

conditioned
stimulus (CS) unconditioned stimulus
(US) comes to elicit fear responses such as freezing behavior and related physiological changes (Figure 7). Studies in rodents have mapped the inputs to and outputs of amygdala nuclei and subnuclei that mediate fear conditioning.[3]

best understood in terms of brain mechanisms, the
amygdala has also been implicated in a variety of other emotional functions. A relatively large body of research has focused on the role of the amygdala in processing of and the use of rewards to motivate and reinforce behavior. As with aversive conditioning, the lateral, basal, and central amygdala have been implicated in different aspects of reward , though the
involvement of these nuclei differs somewhat from their role in fear. The amygdala has also been implicated in emotional states associated with aggressive, maternal, sexual, and ingestive (eating and drinking) behaviors. Less is known about the detailed circuitry involved in these emotional states than is known about fear.

Because the amygdala learns and stores information
about emotional events, it is said to participate in . Emotional memory is viewed as an implicit or unconscious form of and
contrasts with explicit or declarative memory mediated by the hippocampus.

.When a person looks at
the world, he or she is confronted with an overwhelming amount of sensory information—sights, sounds, smells, and so on. After being processed in the brain's sensory areas, the information is relayed to the amygdala, which acts as a portal to the emotion-regulating limbic system. Using input from the individual's stored knowledge, the amygdala determines how the person should respond emotionally—for example, with fear (at the sight of a burglar), lust (on seeing a lover) or indifference (when facing something trivial). Messages cascade from the amygdala to the rest of the limbic system and eventually reach the autonomic nervous system, which prepares the body for action. If the person is confronting a burglar, for example, his heart rate will rise and his body will sweat to dissipate the heat from muscular exertion. The autonomic arousal, in turn, feeds back into the brain, amplifying the emotional response. Over time, the amygdala creates , a map that details the emotional significance of everything in the individual's environment. [4]

Additional Roles
of Amygdala

.In
addition to its role in emotion and unconscious emotional memory, the amygdala is also involved in the regulation or modulation of a variety of cognitive functions, such as ,
perception, and explicit memory. It is generally thought that these cognitive functions are modulated by the amygdala's processing of the emotional significance of external stimuli. Outputs of the amygdala then lead to the release of hormones and/or neuromodulators in the brain that then alter cognitive processing in cortical areas. For example, via amygdala outputs that ultimately affect the hippocampus, explicit memories about emotional situations are enhanced. For example, glucocorticoid hormone released into the blood stream via amygdala activity travels to the brain and then binds to neurons in the basal amygdala. The latter then connects to the hippocampus to enhance explicit memory. There is also evidence that the amygdala can, through direct neural connections, modulate the function of cortical areas.

Further, exposure to emotional faces potently
activates the human amygdala. Both conditioned stimuli and emotional faces produce strong amygdala activation when presented unconsciously, emphasizing the importance of the amygdala as an implicit information processor and its role in unconscious memory. Studies of humans and non-human primates also implicate the amygdala in soical behavior. Findings regarding the human amygdala are mainly at the level of the whole region rather than nuclei. [3]

.the amygdala is indispensable for emotional
conditioning and for the coupling for extroceptive sensory information with introceptive information concerning somatic states (emotion and effect).[5]

.PLEASURE, ELATION, EUPHORIA, ecstasy, sadness,
despondency, depression, fear, anxiety, anger, hostility, and calmthese and other emotions color our lives. They contribute to the richness of our experiences and imbue our actions with passion and character. Moreover, as we shall learn in Chapter 61, disorders of emotion contribute importantly to several major psychiatric illnesses. An emotional state has two components, one evident in a characteristic physical sensation and the other as a conscious feelingwe sense our heart pounding and we consciously feel afraid. To maintain the distinction between these two components, the term emotion sometimes is used to refer only to the bodily state (ie, the emotional state) and the term feeling is used to refer to conscious sensation.[6]...

The Hippocampus Has Only an Indirect Role in Emotion

Early theories of the neural control of emotional states accorded the hippocampus a major role in coordinating the activity of the hypothalamus and cerebral cortex (see Figure 50-5). Subsequent experimental studies on both monkeys and humans showed that the coordinating role is carried out by the amygdala rather than the hippocampus. The hippocampal system is involved in explicit (declarative) memory (Chapter 62).

The distinctive roles of the amygdala and the hippocampus were clearly demonstrated in a study of three patients with selective damage to the amygdala, the hippocampus, or both. These patients were shown monochromatic slides (green, blue, yellow, or red) and their autonomic responses were measured. After some of the colored slides a frightening loud horn was sounded. Patients with the amygdala lesion did not become conditioned to the associated color. Yet when asked how many different colors they observed and how many were followed by the loud horn, the patients responded correctly and had clearly acquired explicit knowledge about the testing situation. Patients with hippocampal damage, on the other hand, became conditioned to colors associated with the loud horn but did not learn how many colors were associated with the sound of the loud horn. Patients with lesions in both the amygdala and hippocampus showed neither autonomic conditioning nor knowledge of the testing situation.[6]

Most proposals describe this structure in terms of affective functions. Indeed, the amygdala is often categorized as an affective region strongly linked to fear processing. Evidence concerning fear conditioning in rats, deficits in the recognition of fearful expressions in patients with bilateral amygdala lesions and the robust responses evoked by fearful faces in neuroimaging studies, have popularized the view of the amygdala as a 'fear centre'. However, this structure is also involved in several functions that are closely linked to cognition, including attention and associative learning.

A central function of attention, a paradigmatic cognitive process, is to modulate sensory processing. For instance, attention to a stimulus increases neuronal firing rates in sensory cortex and is believed to improve behavioural performance. Such 'competitive advantage' also occurs

during the viewing of emotion-laden visual stimuli. The amygdala probably underlies these effects.

Indeed, recent studies have provided evidence that the amygdala mediates the processing advantage of emotional items. Furthermore, in neuroimaging studies, amygdala activation is correlated with activation in the visual cortex and this correlation is attenuated in patients with amygdala damage. Thus, the amygdala might underlie a form of emotional modulation of information that in many ways parallels the attentional effects observed in the visual cortex.[7]

.Another example of kindling is the effects of stress on the hippocampi. ... studies in rats and primates suggest that glucocorticoids are the culprit. Robert Sapolsky explains that glucocorticoids "may be neurotoxic to the hippocampus at the massive levels that are released under extreme stress or during trauma.[4]

.Like the hippocampus, the amygdala is rich in receptors for cortisol (hydrocortisone, ie, stress hormone). While prolonged stress (prolonged cortisol exposure) impairs LTP in the hippocampus, the same stresses facilitate LTP (Long-Term Potentiation) in the amygdala [NEUROCHEMICAL RESEARCH 28(1):1735-1742 (2003)]. [2]

of NYU: "Suppose a major traumatic stressor occurs, of a sufficient magnitude to disrupt hippocampal function while enhancing amygdaloid function. At some later point, in a similar setting, you have an anxious, autonomic state, agitated and fearful, and you haven't a clue why this is because you never consolidated memories of the event via your hippocampus while your amygdala-mediated autonomic pathways sure as hell remember." [4]

[1] İnanç, B. Y., Bilgin M., Atıcı M. K.; Gelişim Psikolojisi, Nobel Kitabevi, ISBN: 975-8561-31-6, s 162, 164

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<title>THE ROLE OF TIMEFRAME IN DECISIONMAKING</title>

What is the reason that makes a decision correct? It is first of all the availability of correct and sufficient information. You should not have an opinion before you have sufficient information! said Uğur MUMCU, a renown newspaper researcher-writer and assassin of fundemantalist activists. On the other hand, the governors of countries which have the largest information sources and means can and do make mistakes. There must be some other reasons

What is the role of time in the correctness of the decision? Is being at the Right time right place enough? Thinking in the speed of light or To understand papa before hearing the pa, (Leb demeden leblebiyi anlamak, a Turkish addage) etc Does thinking fast provide correctness to the decision or even contribute to it?

Is it good to make all decisions quickly? Is this approach that speed is more important than anything else as in the cowboy duels valid in all other cultures? Should it be valid? Does speed in the decision making process guarantee correctness?

There is also the case, in the Turkish culture where a village child, under the pressure of life, can not answer the question of a TV reporter because he is afraid of saying anything wrong Maybe that is the reason our educators emphasize 'make a decision as quick as possible and say something rather than remain silent'.

In fact, we can look from a view point so that these two vastly seperate examples can appear to be not so far. This point of view is not the speed of the decision making process but the time, the duration dedicated to making a decision.

The thing that determines the correctness of a decision is the timeframe dedicated to its formation and the chosen moment for its declaration. One should decide first when the decision should be taken in order to make the right decision. Then decide how long it should take, the timeframe necessary to make this decision. Determining the timeframe correctly and applying it give the result of a correct decision.

The processing of information in our brains does not happen in a moment. It takes time. Just try it when you can not remember something. Try to recall a few things related to the thing that you can not remember. The second or third degree things related to these. Leave some space in between and hesitate. You will remember the missing thing innately in a while.

The phenomena related to the decision while making it are processed in our mind or in the common wisdom similarly to the above. Phenomena trigger other phenomena that are semantically related to them. The depths reached by chain triggering or cascade connections increase according to the seriousness of the situation. Things that have to be accounted for must be kept in the working memory where they can easily be noticed. The solution of the problem may require obsession and concentration even focusing to the matter. While some of these effect the efficiency of processing, all of these happen and are controlled according to the sense of time provided by the timeframe.

The timeframe, namely the duration and the deadline to make a decision is a unique subsistance for making the right decision. If you do not put in enough time you may miss all the phenomenons related to the subject. You may miss the chains of phenomena related to each other, the cause and result relations. You may make decision quickly and easily because your working memory is not overloaded. This gives you the possibility to handle more difficult decisions to come.

If you dedicate more than necessary time to decision making, you may get lost in apparently related but not vital details and get drowned in depths. Your working memory gets overloaded, you may lose the freshness necessary to make healthy decisions. Obsession, concentration and focusing becomes an open-end purpose in themselves when they are not directed to a substantial aim and may damage your personal health permanently.

Determining the right moment and the timeframe to make a decision provides correctness. This is difficult to apply in actual life ofcourse. For ex. in the emergency intervention of some cases, is the timeframe shorter than duration necessary for choosing the right option.

The doctor that intervenes to an emergency situation is forced to choose at least ONE of the available options rather than the best one of the available ones. It is not more important to find the best choice than applying at least one choice as quick as possible to give the patient a chance to live. The timeframe alone determines the correctness of the decision in emergency conditions.

The statesmen are sometimes in a similar situation when the necessary timeframe is much longer than available time to make a decision. They can not wait and see the preliminary results of their decisions and apply recursion to correct them, which may take quiet sometime in social matters.
It is not a surprise good politicians have fortitude and clairvoyance.

If carefully studied, one can observe that Einstein's proof of Newton's mechanical movement law is wrong in speeds close to the light's, is based on looking at the phenomenon from a different point of observation, namely the timeframe that movements take place.

Timeframe determines correctness of the decision.

Ali R+ SARAL

<title>Thinking by Feeling</title>

Human thinks by feeling.

We learn words with sounds. We learn thinking by listening sounds.

We think with sounds. Our inner-voice voices our thoughts out of our will.

(https://www.psychologytoday.com/blog/the-voices-within/201401/do-deaf-people-hear-inner-voice)

View, lip reading, the view of words may replace the function of hearing in deaf people.

The fundamental in thinking is the perception element. The fundamental is sound.

Perception function of the brain must have developed with priority in the evolution process.

Human thinks by percepting that's why it is difficult to think abstract things.

<title>ON THE NATURE OF CONCENTRATION</title>

This is the first of a series of my articles on the nature of human concentration. Actually, concntration is not an exclusive attribute of the human-being.

Concentration is an attribute of matter. Concentration is described as 'the situation of coming together at one point.' Concentric means 'having a common centre.'

The meaning changes a bit when it comes to the concentration ability of the human mind. Merriam-Webster defines it as 'direction of attention to a single object'. It is misinterpreted as focusing in the daily usage.

An easy way to understand, demonstrate and control the abilities of the human mind is to think visually. In terms of looking with our eyes, concentrating means to look at something and see other things only in relation to this reference point. To focus means to look at something and not see other things at all.

To focus means to limit your attention to a specific object(for ex. inclusion of something into attention). To concentrate means to change the character of your attention so that included thing appears in your focus on the basis of some sort of exclusion of others, so to speak.

It is possible to lose concentration but keep focus, when looking. You can relax your attention, but change the size of the area that you look at, for ex.a whole person or a face. This is important for implementing relaxed attention.

You may also increase your concentration but lose focus, if you like, a little bit more complex though. You may look at nothing specific, but enjoy fully the wide wiew on the coast of Istanbul Bosphorus.

Concentration and focusing abilities are not totally visual. These can be observed in all forms of perception, cognition, motor faculties. The embodiment of self, the sense of being is closely related with the sense of time. We feel our being, our existence at the moment we are in, namely 'the specious present', or now.

img id="BLOGGER_PHOTO_ID_5209217644021935106"

The length of specious present changes, according to the situation we are in. Also, the frequency of the renewal of our sense of now or feeling one's self or being changes. When we are doing something we do not feel our being directly all the time. In fact concentrating on the thing we do reduces the frequency of our feeling of self. This also reduces the sense of time. This frequency also corresponds to the perception frequency. When the perception frequency increases sensitivity increases.

The specious present concept is somewhat belaguered at this point. The specious present is a duration of perception, of which total duration is effected-determined by concentration.

Attention is an abstraction of focus. Attention determines the limits of things we deal with at one moment. If we deal with more than one thing the length of the moment expands, so the specious present increases.

This explains why with high concentration sometimes, we do not feel the time that passes and sometimes we do feel it longer than it really is. If we do a single simple thing with high concentration, specious present is short, so we do not feel the time, or feel it as if shorter. On the contrary, if we do a complex thing with high concentration we feel as if the time passed is much longer than it really is.

The specious present are the moments that we feel our being, self.The specious present are the times that the brain's cognition works consciously. Healthy functioning of human mind depends on the average balance between the conscious and subconscious activities. For example, to understand a

foreign language with facility, you should not concentrate too much but you should relax a little bit, so that the things you hear at the specious durations get processed between them by your subconscious.

Working on complex tasks with high concentration for long durations, causes us to develop skills that enable us keep our specious present as long as possible, with the highest frequency. If one is not well equipped and trained to handle these skills, long duration high concentration complex jobs may suppress and hurt the human subconscious or increase the perception to the point of seeing-hearing halucinations. The suppression of subconscious may inevitably hurt the whole psychology and cause the human mind to react in a series of psychosis.

In order to avoid all this mess, you should simply apply the 20 20 20 rule while working. Every 20 minutes, pause whatever you're doing and stare at something 20 feet away about 10-15 paces away) for 20 seconds.

The bottom line is, this type of jobs are one of many choices, you may choose to climb a high mountain or serve at an air traffic control center as an engineer or air traffic controller, or choose to serve as a surgeon. It is up to you.

<title>The Importance of Sartre's 'Sketch for a Theory of Emotions' for Aviation</title>

Sartre's 'Sketch for a Theory of Emotions' could prove to be a tangible asset for air traffic controller and pilot training. It could be a solid reference for the teachers who have to teach the role of emotions in decision making.

Large Systems engineers would definitely benefit from it forcontrolling themselves when working under heavy load or usinghigh concentration for long durations.

Philip Mairet's translation from Routledge Classics says"A conciousness becoming emotional is rather like a consciousness dropping asleep" p. 51.

In fact Sartre refers to emotions as a special type of consciousness as in an "unreflective conduct" which is not unconscious as in the act of writing.

He explains the origin of emotions as a " lesser existence or a lesser presence(or a greater existence, etc.). In a word, during emotion, it is the body which, directed by the consciousness,changes its relationship with the world so that the worldshould change its qualities. If emotion is playacting, the play is one that we believe in p. 41.

As Sartre suggests, we degrade ourselves into a lower, fictionalworld when we are faced with facts that we cannot manage to overcomewith our ususal abilities. At this point, our consciousness "gets caught in its own snare." It has created a fictional world to escape into and now it believes what it has created, as in dreams p.52.

Sartre's explanation on p. 52 of Rouledge's edition may explain vertigo situations and false sense of safety caused by'over confidence' and similar feelings in aviation.

Sartre's 'Sketch for a Theory of Emotions' is a difficult to absorb but a precious treasury that can be used to understand Crew Resource Management and other situations in aviations. It has to be studied by teachers and the results have to betaught to pilots, ATCO's and engineers. The aviation world could be a better place if only this were done.

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<title>Relaxing After High Concentration- 1</title>

What can be done after a tiring day to relax? Even people working in normal jobs have to spend effort to relax after some heavy loaded days. This article is the first of a series that explains some of the techniques that can be used to relax... After the first article which is about 'Focal' and 'ambient' vision types and their relation to relaxing, I will write about getting rid of mental energy by using it for nothing and the function of imagination. As the last point of interest, I will propose a technique to get rid of the high concentration and relax by alluding to Sartre's Imagination and Consciousness.

Every engineer, air traffic controller, large systems operator who work with computers have to focus their attention to a small area for long periods of time. These people have difficulty looking at large areas and at distant things when they get out of their working place.

Our mental operations related to vision are of two kinds- focal and ambient. Focal vision is almost always related with fovea which is without rods and related with small details, pattern recognition. For example reading writings and identifying small things. Ambient vision is related with seing things on the periphery not the center. It is related with orientation and ego motion - to feel the speed and direction of our own movement[1].

Our focal and ambient vision abilities and mental resources define each other actively. For example, we can read a book while we walk down the aisle or we can read the street names while we drive. This situation show that there is an effective time sharing between them, they are executed by different brain structures and their information processing characteristics are different.

It is suggested that an effective time sharing between focal and ambient vision exists because the ambient vision is an automatic process[1]. The mental tiredness created by the concious process of the focal vision in the case of long durations, may be elavated by the automatic process of ambient vision. The problem, at this point arises in the case of long duration high concentration. High concentration stops the automatic process triggering. Hence, the relaxing of the vision mechanism of the mind by its natural balancing becomes impossible. The relaxing of the mind in some cases by driving a car may be related to the balanced use of automatic processes and attention.

The mind's vision processing gives strong hints about its whole processing. The focal and ambient vision mechanisms may abstractly be related to focusing on a subject and feel the peripheral concepts and objects related to this subject automatically. For example, it is mind's ambient like mechanisms that enables us to trust him.

When you look at the carpet under the table, even though some of the patterns are behind the table's legs you still percieve the situation as if you see the whole carpet. The mind deducts the continuation of patterns from the way day come and although they are not seen it is felt as if they are[2]. The deduction of patterns may be related with the ambient vision and more general automatic processing of the brain.

When we see an object, our mind deals with its visual attributes primarily. It completes the missing parts with good continuation if they can not be seen. As the time passes, the semantic tree objects begin to get triggered. An object passes to the working memory after staying in the perception memory for a certain amount of time.

Hence it begins to trigger the semantic connections related to itself[3]. When you see a person, even though you do not focus on him, his height, suit colour, physical attributes, gender, etc. And his abstract attributes get triggered and gets prepared to serve your attention. In fact Sartre's example for visual completion is valid for mental completion also.

Focusing infact is leaving enough time for looking. If we look at a constant object and continue to do so for a long time, our attention concentrates on that object. Blinking period increases, even our breathing decreases. A large systems engineer who works with high concentration for long durations gets physically tired even by simply concentrating. The engineer focuses on a specific subject and related issues, building semantic relations. This process continues iteratively till it converges to a solution. To change a single line of code in an air traffic control system the whole system has to be studied in relation to this change and its functional effects have to be analized. This process requires a high level of concentration to be maintained for upto six months.

Not only people who work at long duration high concentration jobs but also even students who prepare for finals have difficulty in relaxing after a complete working day. Everyone has developed a personal technique to relax intuitively or by experience. My point is, large systems operators have to be trained to learn and apply these techniques systematically...

Let's return back to the vision metaphor. If we focus on something and look at it sternly, our looking focus gets smaller, concentration increases to maximum, on the other hand ambient vision begins to increase and after a while our vision gets blurred and our eyes begin to contemplate. There is a natural control mechanism.

We adjust our concentration level by looking and seeing. The balancing of each of focal and ambient vision in the flow of the normal life adjusts our mind's thinking speed[4]. At the beginning of our cognitive evolution lies in the visual ability. Systematic seeing and looking may give us some clues for relaxing after long duration heavy concentration.

After high concentration jobs with focused vision one should give more chance to the automatic processes of the ambient vision. It would be usefull to stay 3-4 hours in an environment with a wide view and far distances. To view the depths not the surface, the view not the objects but the volume created between them would be useful. To view objects in their context and imagine the missing parts that can not be seen.

After non-visual jobs that concentrate on abstract concepts it would be useful to stay in a wide view environment with horizon and a far sea sight too. To look at the things on the surface, to view objects without their relations, to bring everything to the surface would be necessary...

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Some allusions::

[1] Multiple resources and performance prediction
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Keywords: Attention; Performance; Time sharing workload.

4.3. Visual channels

In addition to the distinction between auditory and visual modalities of processing, there is good evidence that two aspects of visual processing, referred to as focal and ambient vision, appear to define separate resources in the sense of

(a) supporting efficient time-sharing,
(b) being characterized by qualitatively different brain structures, and
(c) being associated with qualitatively different types of information processing

(Leibowitz et al. 1982, Weinstein and Wickens 1992, Previc 1998).

Focal vision, which is nearly always foveal, is required for fine detail and pattern recognition (e.g. reading text, identifying small objects). In contrast, ambient vision heavily (but not exclusively) involves peripheral vision, and is used for sensing orientation and ego motion (the direction and speed with which one moves through the environment). When we successfully walk down a corridor while reading a book, we are exploiting the parallel processing or multiple resource capabilities of focal and ambient vision, just as we are when keeping the car moving forward in the centre of the lane (ambient vision) while reading a road sign, glancing at the rear view mirror or recognizing a hazardous object in the middle of the road (focal vision).

Aircraft designers have considered several ways of exploiting ambient vision to provide guidance and alerting information to pilots, while their focal vision is heavily loaded by 166 C. D. Wickens perceiving specific channels of displayed instrument information (Stokes et al. 1990, Liggett et al. 1999) It is appropriate to ask whether the successful time sharing of focal and ambient visual tasks results because ambient vision uses separate resources, or because it uses no resources at all; that is, processing from ambient vision may be said to be 'preattentive' or automated. At the present time, insufficient data exist to answer this question, as few researchers have attempted to examine dual task performance of two ambient tasks. One study (Weinstein and Wickens 1992), however, did suggest that the second (pre-attentive/automatic) explanation offered above may in fact be the more correct one.

[2] Jean-Paul Sartre: Basic Writings, Edited By Stephen Priest, Routledge, 2005
Imagination and Emotion, The Psychology of Imagination, Consciousness and Imagination

P 95
For an objects or any element of an object there is a great difference between being grasped as nothing and being-given-as-absent.
□
For instance, the arabesques of the rug I am viewing are both in part given to my intuition. The legs of the arm chair which stands before the window conceal certain curves, certain designs. But I nevertheless seize these hidden arabesques as existing now, as hidden but not at all as absent. □ I grasp what has been given me of their continuation.
□
It is therefore in the way in which I grasp the data that I posit that which is not given as being real. Real by the same right as the data, as that which gives its meaning and its very nature. Likewise the successive tones of a melody are grasped by appropriate retentions as that which makes of the tone now heard exactly what it is. In this sense, to percieve this or that real datum is to percieve it on the foundation of total reality as a whole.□

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If I want to imagine the hidden arabesques, I direct my attention upon them and isolate them, just as I isolate on the foundation of an undifferentiated universe the thing I actually percieve. I cease to grasp them as empty but constituting the sense of the percieved reality, instead I present them to myself, in themselves. But at the moment that I cease to concieve them as continuous present in order to grasp them in themselves, I grasp them as absent. Of course they really exist over there, under the chair , and it is over there that I think of them, but in thinking of them where they are not given to me, I grasp them as nothing for me. Thus the imaginative act is at once constitutive, isolating and annihilating.

<title>TRIBUTE TO THE CONSCIENTIOUS CONSCIENCE and IT'S VIGIL SUB</title>

I am not sure,
whom I learned these from.
An old sailor,
an Echo on the Alp mountains?
Or the scent of the trees
at a coffe cottage in the Black Forest

The possibility that a human faced with an emergency situation after a long ruhig-calm period, may react correctly is little. Thus, there is a lesser possibility of a new accident before the aftermath of the previous gets forgotten.

After a long period without problem, Air Traffic Controllers have difficulty in handling a serious route conflict during their surveillance period.

The same with automobile driving. The relaxed driver takes over a truck appearing in front of him suddenly, with the same mood.

The problem is the source of this relaxed mood. The brains of people dealing with difficult or boring tasks learn the process of this task first. Once this schema has been formed in the brain, the related task can be done automatically with an automatic process.

Automatic processes may be triggered by both the concious or the sub-conscious. Suddenly faced with an emergency situation, the human brain has to stop the automatic process and initiate a controlled proces to be executed by the conscious.

The cause of the difficulty is the interruption of a process that is being executed by the sub-conscious The fact of the matter is, if a process controlled by the sub-conscious is interruptable, then that may mean that, that process is not automatic.

The solution may be that the conscious may interrupt sub-conscious processes sporadically or the sub-conscious may pass the control to the conscious at the wake of a risk increasing over a threshold. The interruption of sub-conscious processes automatically may be a faster but difficult to recover solution. May be, this solution is a form of situation awareness.

Air Traffic Control, namely THE CONSCIENTIOUS CONSCIENCE and IT'S VIGIL SUB is a performance art. Air Traffic Controllers are chosen with special exams and health tests.
ATC(Air Traffic Control) is a very special human being. 300 controllers work at EUROCONTROL (European Agency for the Safety of Air Navigation)'s Maastricht Control Center according to the Dr.Vermeiren's presentation on the internet. Each and every year 2-3 of them have to leave for mental reasons. This means roughly 30 of your colleagues have to bite the bullet at the end of 10 years.

We, the society have to appreciate the work of air traffic controllers and their mental sacrifice at this moment of the heavy summer season Motivation is a not very well managed point in the European ATC, somehow lessened to stipend.

<title>HOMEOSTASIS IN ATC</title>

Homeostasis (from Greek: ?µ??, homos, "equal"; and ????µ?, histemi, "to stand" lit. "to stand equally"; coined by "Walter Bradford Cannon" href="http://en.wikipedia.org/wiki/Walter_Bradford_Cannon") is the property of either an "Open system (systems theory)" href="http://en.wikipedia.org/wiki/Open_system_%28systems_theory%29" or a "Closed system" href="http://en.wikipedia.org/wiki/Closed_system", especially a living "Organism" href="http://en.wikipedia.org/wiki/Organism", that regulates its internal environment so as to maintain a stable, constant condition. Multiple "Dynamic equilibrium" href="http://en.wikipedia.org/wiki/Dynamic_equilibrium" adjustments and regulation mechanisms make homeostasis possible. The concept was created by "Claude Bernard" href="http://en.wikipedia.org/wiki/Claude_Bernard", often considered as the father of "Physiology" href="http://en.wikipedia.org/wiki/Physiology", and published in 1865. (WIKIPEDIA)

Air Traffic Control systems are discreet event dynamic large systems. They are composed of three sub systems the visualization of the traffic data - radar data processing, the planning and partitioning of the operational load - flight data processing, and all the related communications - ATN . There is also the substructure which provides the necessary services for these three subsystems - SYSTEMS. ATC system are also a combination of human and machine elements. There are many operators of different types.

I would like to point out at the homeostasis in the air traffic control systems between the technical and operational groups. The operational group comprises air traffic controllers and the various people in their management hierarchy. Most of these people come from an air traffic controller back ground. The technical group is composed of a mix of engineers and air traffic controllers Some of the engineers come from a technical background while some of them come from math and science university education and engineering faculties. Air traffic controllers in the technical group function as interface to the operational group. They work in requirements specification, quality control, configuration management and testing.

The safety created by an air traffic control center is the result of a combination of the work of the operational and technical work done. When the technical side fails, the operational measures are used.

For example, seperation is increased. Also, when the technical facilities get old and are out of date, operator load increases. For ex. if the radar views are not good, operators have to cope with this difficulty somehow.

The homeostasis between the technical and operational side works in ATC so that when the technical side goes down the role of the operational side increases or vie versa. When everything is perfact operational side relaxes a little bit.

Why am I writing this note? It is not a big deal up to this point. The interesting phenomenon begins when we observe: If one of the two elements that comprise the homeostasis dominates the relation, what happens then? For ex. operational side effects the technical decisions for various reasons
These decisions may vary from setting unrealistic deadlines to deciding which technical systems to buy

The dynamic nature of the homeostatic balance may determine the sudden or unjustified changes in the balance. In fact the flexibility of the system is designed so that even if the radar views are lost air traffic control can continue with the strips. The risk of losing touch with the technical reality is more on the long run. I believe, it is very difficult to maintain and develop a technically upto date system while carrying on the day to day ATC duties.

There is a tangible risk in ATC which may arise from the tendency of one of the technical and operational groups to dominate the other.

Ali R+

Note: I woke up to the importance of this issue because of the contrast I noticed btw Turkey and Karlsruhe in regards to this matter. Thanks again to Herr Ehrenberger (ECO).

<title>The Effect of Concentration on Self</title>

When we hold something in our hand we feel its shape, heat, texture, humidity and thoughness.

We feel the same attributes of our hand relative to that object at the same time.

Anything that we percieve with our body makes us percieve our body also.

Everything that we percieve with our body reminds us the self. They nourish the self and makes it stronger.

Any kind of systems operator - from a simple driver to a pilot or air traffic controller, nuclear - thermal energy reactor operator -must control how much they concentrate and which things they divide their attention.

Situation awareness requires the preservation of self at even the most critical moments against full automaticity.

High concentration directed at external things stops the effect of their reflections on the self.

This situation causes the air traffic controller who has just solved a critical route conflict, to forget the other minor cases which still require to be handled.

The controller should use tactile control instruments (driving wheel design etc) or touch things while controlling so that he maintains self through touching. Moving, touching control strips are necessary for the maintanance of controller's self and hence his viewpoint.

Body neurishes self.

<title>The Role of Design in Creativity</title>

Some artists
create spontenously some think ahead and even make roadmaps to reach the end of
a creative process: the work.

Spontenous
creativity may make recursive walk throughs of the incomplete work. Sometimes a breakthrough happens and you
enter a creative space which you just imagine at one step or it is
relatively easy to proceed. Intuition is
triggered by the minute steps of the creative process even by coincidence.

Sometimes
the creative process gets very slow and difficult and come to a halt. The waiting period for a new beginning may
take a few days or years in some cases.

Large scale
work creation, even sonatas, chamber music, are difficult to manage without
seeing forward. Musical structure helps
the composer to keep a sense of direction while proceeding the creative
process.

Design helps
the creator to do size scaling. For
example, selecting a variations form
enables you to increase the size as you wish.

Design helps
the composer to divide the heavy load to small pieces and concentrate on every
and each section. Design also enables
the composer to correlate the small pieces and build up music that
is impossible for an individual to keep
in mind as a whole.

It helps to
define the entities that build up the work.
This gives the possibility to observe the relative affect that arises
when they come together.

The composer
interacts with instrument players and singers through the score. The design of instrumentation and characters
in an opera is simply the design of interface between them.

Design also
enables the composer to set explicit intention and task set for the work. The composer must know what he wants to get
at at the beginning. This increases the
coordination of many elements of a complex art work.

The timing,
duration, flow of events in an opera, flow of information in an abstract music
form, the characters, moods all can be designed.

The design
has to be guiding and opening the way when it gets narrow. It should determine the main contours of the
work. It should not specify all the
details. This may cause you to get lost
even at the design
phase before beginning to write.

The more
details defines the design, the less flexible it becomes. But this does not mean that the design even at its birth moment should not define any details. Sometimes you work for 12 months for a simple symbolic trick that you believe it has to live for as long as possible.

Designs help
the creator to come over deadends. The
design of the nature is the genetic material in the nucleus of each living
creature. The nature has overcome her

failure by being flexible enough to try new species with different genetics
namely different design materials.

Design has
to be dynamicly updateable. The tendency
to make change or not is left to the creator.

The dynamic
decisions may be given by cognition or by intuition. The balance between them depends on the artist and th character of the work,
also on the genre.

The design
serves as a prototype which serves as a model for the intuition and imagination
of the composer. It gives clairvoyance
to the composer mind's eye.

Design has
an organising, guiding and regulating affect on the creative process. It also enables the creator to repeat the
same design and create other works with the same theme. The 'Rondeau' form is a
simple example.

Design is
more than what I have described upto this point. It can be described but it is not definable. I believe, the flexibility of
the design element of the creative process is at its best when it leaves
intentional spaces for intuition and crafty spaces for imagination.

Ali R+ SARAL

<title>TO BECOME A STREET JANITOR</title>

The street janitors of Koşuyolu are special. This attribute arises because of the structure of the vicinity which is mostly houses with small gardens and relatively large deserted streets. In fact, the janitors of all the vicinities in Istanbul are special.

I have always been amazed by the magic of the janitors since I was a small child. The first individuals that I had a chance to meet out of my family were the street janitor, the postman, the 'simit' seller and after that the ice cream seller In distance the grocery shp owner, the butcher and others

It was very difficult for me to depart from my mother for a whole day when I began to the primary School with out going to kindergarten first It has been carefully noted in our family jargon that I had

cried □I won't ever go to school, I will become a janitor!□ in response to my father's military offcer smile mixed with a 'shining golden tooth' in it, which generally indicated an intrigue. As far as I could see At that moment, being a janitor was the closest job that I could perform closest to my father.

Being a janitor has its magic like any other job. A service job□ Our vicinity's janitors have always been people who clean up around silently, avoiding personal contact and they use to disappear in an unknown time as they appear□ Carefully, they give succinct but not predominant answers when conversed□. What matters in their relation with the inhabitants of the street is the service.

I love to watch how the janitors perform their jobs since my chidhood□ These 'guys' are masters of the 'let it go' philosophy. As you know, our people in Turkey are not brought up with personal discipline of cleanness yet, unfortunately. So, the janitors have a lot to do every day□ I can observe that the janitors in Istanbul have it 'ab die Nase - up tp their noses□' The thing that most excites me is to watch how these heavily loaded janitors manage to confront this difficulty.

Working discipline, to protect their own health and patience, to preserve his energy for his family and the people themselves they serve□ Choices between all these are reduced practically to choosing the various types of rubbish that lie on the side way or the street and sweep them into his handheld bucket with his room. Janitors are masters of 'let it go' or 'may it stay'.

Sweetly□ The janitor stands on the street with an inner peace, grace and confidence that mar s, if he leaves something on the street, he will find it somewhere close the next day.

Ali R+
April the 23rd 2008(Turkish Children's Day), Koşuyolu

<title>TOWARDS A MATHMETICAL MODEL OF CONSCIOUSNESS</title>

Consciousness is a function. Its output is awareness.

Awareness = Consciousness(□)

Consciousness may produce different awarenesses qualitatively or quantitatively depending on time. For example the awareness of self may change at different moments of the day. Consciousness depends on time.

Awareness = Consciousness(time, □)

Consciousness changes for different subjects. A person may be more cost aware while an other does not. Also we can talk about the consciousnesses of a single person or a group of person. For example, human rights consciousness of a country or nation.

Awareness = Consciousness(time, subject, □)

Consciousness may change based on the context. Different contexts may cause the consciousness function to produce different awarenesses. Seeing a piano carried may make you think the weight of it while listening a performance may make you think about the instrument quality of it. Consciousness depends on context.

Awareness = Consciousness(time, subject, context, □)

Consciousness may change according to the experience of the person it belongs to. An experienced engineer may handle a problem and estimate its difficulty much different than a novice. Experience helps form the consciousness indirectly and as part of the background. A collection of past awarenesses may help form the experience. Experience is more than a collection of awarenesses but it also includes their interactions with each other and with knowledge as a whole.

Awareness = Consciousness(time, subject, context, experience, □)

Consciousness may change according to the amount and quality of knowledge it belongs to.

Awareness = Consciousness(time, subject, context, experience, knowledge, □)

Consciousness is a function or a process. The outcome is awareness. Awareness must be calculated from the input parameters, time, subject, context, experience, knowledge and the last parameter. This calculation may be done with an algorithm. Actually this algorithm can be defined as Consciousness itself□ This brings us to the conclusion that Conciousness is
somewhat recursive.

Awareness = Consciousness(time, subject, context, experience, knowledge, Consciousness(□))

Thinking of the development process of a child, and taking consciousness function as a constant such as sleeping vs being awake, the formula given above can explain the accumulation of experience and knowledge.

The problem with this approach is Consciousness function itself is not constant even during a day and also it changes gradually through a longer period of time. Consciousness learns and improves itself. This can be seen in artificial neuralworks with a learning mechanism.
If we make a change according to this point, a final formula could be:

Awareness = Consciousness(time, subject, context,
experience, knowledge, algorithm)
algoritm = Neural Network (previous Consciousnesses())

I admit that this may look quite subjective for some but it is possible to reduce this assertion to concrete examples and narrow the subjectivity to the point of objectivity.

For example, if we design a system which checks numbers in its input, and senses a sequence that increases by two, the context becomes absolute. Experience may be formulated as past sequences that comply with the increase by two rule. Knowledge becomes the mathmetical calculation. The biggest difficulty is simulating the evolution from experience to knowledge. Knowledge may be limited first as sensing a regular increase, than sensing a regular increase of two. Neural Network algorithm and its learning ability may be used to teach this to the system.

Again, the key thing here is application. This model may be useful, if only applied in a specific domain to handle a specific problem.

<title>Situation Awareness vs Self Awareness</title>

'to exist is, for consciousness, to appear to itself' (Sartre, [1]).

Situation Awareness is the Perception of the elements in the Environment within a Volume of Time and Space, the Comprehension of their Meaning,and the Projection of their Status in the Near Future (Endsley, [2]).

SA is related to medical, safety(fire), defense, energy, transportation, any large systems, that require performance abilities from pilots, captains, drivers, operators or performers.

An airline pilot's SA may include[2]:
Geographic(location of own A/C, airport, cities, way points etc),
spatial(altitude,heading, velocity, flight path etc),
system(A/C status info etc),
environmental(weather, visibility etc.)

Situation Awareness is the result of operator consciousness.

Awareness is the result of the function named consciousness:
Towards a Mathematical Model of Consciousness(http://largesystems-atc.blogspot.com/2010/12/towards-mathmetical-model-of.html)

Awareness = Consciousness(time, subject, context,experience, knowledge, affections, algorithm)

algoritm = Neural Network (previous Consciousnesses())

Situation Awareness is the result of the algorithm used at that moment by the operator in correlation with the context, experience, knowledge and affections.

Namely, situation awareness is determined by the type and character of the consciousness that the operator has at that moment.

There are different types of consciousnesses.
reflective consciousness - self-awareness - feel your own existence while you act
pre-reflective consciousness - unify with the objects, percieve your existence through the objects you interact
unreflected consciousness - autonomous processing

Different operational situations may require different type of consciousness or set of mind.

The operator/performer should not only be aware of the situation he is in but also be aware of the mode of consciousness he has.

Ali R+ SARAL

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<title>The Necessity of Noise</title>

What is noise? It is a threshold. A threshold at which point a signal loses its identifiability. Here, signal means meaningful activity which has a purpose or value. A group of people sitting at a bar, makes noise because of talking with each other relative to the silent state of the bar or relative to the music being played at that moment.
Noise may carry abstract meanings and may carry various threshold functions such as noise in public decision enquettes or unrelated information on a subject you are trying to make a decision.

If we think of neural networks in our brains, these circuits make correct decisions although they get some garbage(noise) in their inputs, namely not very clear situtions.

Mysteriously, noise may decide what is wrong what is right because it sets the environment to make a decision.
It eliminates what is relevant what is not according to the subject, it sets the boundaries of the elemnts that will make the decision.

Noise sets the threshold for making a decision. In situations where the input namely our observations of the phenomena around us are not clear, we try to clear things by changing or adjusting to the environment before we make decisions. In fact we solve the problem by adjusting the noise threshold. Noise may be necessary in order to make healthy decisions when the inputs are not completely clear.

<title>THE DEVIATING MIND</title>

To Mr. Ahmet ARZIK,

Brain is one of our organs which does not have the ability to move. Think of the brain's functional development during the process in which a new born grows up to become an adult. Our brains develop from the cognitive level of a little 'snail' which moves with its nutrition instinct, to a chess master who challenges a supercomputer

What surprises us is not solely the impressive amount of change that our cognitive abilities undergo in our personal development process This organ of ours which can not even move by itself, can deviate itself in a matter of a season, a couple of days or a few seconds because of the changing environment or its own inner conditions. According to our mood may this organ remember what it likes or forget what it does not, namely it deviates our remembering ability depending on the subject, it certainly does not work very well in hot summer days, on the other hand ina state of emergency, your brain orders your body to make the correct move in a much shorter time than you can consciously decide...

If we look in our cognitive activities closely, we can notice a complexity rising from variety and adjustability. This complexity increases because of the variety and uniqueness of each adult person's individual solution in comparison to many others 'No two fingers of a single hand are the same'. On the other hand, 'Every person is different but not different from all'

The fact that our brains have many different abilities, gives us the possibility of creating our cognitive functions one by one through different combinations of these abilities. For example, a not very well educated person can still make quick and correct decisions with his/her feelings and instinct. University language preperatory school English teachers can at least handle 'sharp' students who have got much higher grades in the university entrance exam than them, with their teaching experience and knowledge. Our cognitive abilities can not only change depending on the mental, social and physical conditions but they also vary from person to person. The effect of his/her family's child upbringing, the individual's knowledge and experience reservoir, the point he/she stands in life, creates variety between individuals and how they survive in the competition to be successful.

Society and individuals reduce the difficulty of problems they meet by converting them to easily percievable models. Even to a single symbol or figure... In this process our brain is sometimes reduced to a small black box by the model makers. Society has the tendency to group everything related to cognitive ability under the title of 'intellect' Also, if a person is 'sharp' he/she is frequently considered to be so always and under all conditions whatsoever

Everyone of us takes an important exam at one stage of his or her life. We all remember the level of 'intellectual sharpness' or acuteness we have reached during our preparations. On the other hand, there may be moments you may have difficulty to utter even a single word after you wake up in a hot summer morning. Then, which of these two people is you, yourself? The 'sharp' or the 'moron'? The answer is 'None of them solely'. Then what is wrong about the question? The mistake is in the way we look at the cognitive abilities of human-beings We should never forget that, even though our brain can not move an inch by itself our mind does not have a static and frozen architecture or capacity. Our brain manages to cope with changing situations not by changing its location but by deviating its own self.

A person's mental abilities change according to its age, the situation he is in, the current subjects he deals with and many similar factors. If an experiment were made, even the sharpest person on earth might not be able to make the right decision if he were being interrogated as a prisoner of war or if his airplane lose one of its motors at 10000m's altitude, given that he does not have the necessary training and experience Moreover, even if he had the knowledge and experience to do so, he might still not be able to make the right decision in some cases, because the professional human brain can not stay as constant as it were when it took the qualification exam

When the architecture of the human mind is inspected, an anatomical and biological wealth can be observed underneath its functional variety. It is not a wonder such a complex living architecture can create personalities with extraordinary abilities The most wonderful is the fact that brain is able to provide the human-being everything needed to cope for its complex social and individual challenges.

The complexity of our brains is reflected in the way we percieve and interact with things and other people. Designing tools and systems to be used by humans requires to handle this complexity in a simplified way. Faced with any complexity, we tend to make abstractions. Abstractions not only reduce the number of the things we are concerned but also limits the domains of their items. This also applies to our approaches to the complexity of our brains.

Wickens Information Model is developed to calculate how long it will take for the user to respond to an input. The below given depiction has got so much popular that it has gained a function similar to the model that describes to primary school kids the creation of seasons based on the so called ellipse shaped path of earth around the sun.

The Wickens Information Processing Model was created to provide a convenient method to calculate the response time of the user to a signal from a system.

.Attention Resources

Perception Cognition Motor
(transfer to .(math,decide, Response
working memory) ...memory transfer)

Short term sensory store Long term memory

Visual Image Store□□□□.Dltm=infinity
Dvis=1500[900-3500]msec□Mltm=infinity
Mvis=5[4.4-5.2]letters□□□Kltm=semantic
Kvis=Physical

Auditory Image Store□□.. Working Memory
Daud=200[70-1000]msec□.Dwm=3[2.5-4.1] chunks
Maud=17[7-17]items□□□Dwm(1chunk)=7[5-9]chunks
Kaud=Physical□□□□□..Dwm(3chunks)=7[5-226]sec
□□□□□□□□□□□□...Mwm(1chunk)=73[73-226]sec
□□□□□□□□□□□□□Mwm(3chunks)=7[5-34]sec
□□□□□□□□□□□□□Kwm=Acoustic or visual

Transfer durations:
(Perception)--->100msec(cognition)-->70msec(motor)->70msec

- Attention resources are used in all three stages..
- D = decay, M= residing duration in memory, K= representation format of the information
(EBERTS, Prentice Hall, User Interface Design, sayfa 166).

An other name of this model is Discrete Stages Model. The contributions of the Wickens Model may be outlined as:

1. Perception does not happen in a single moment. On the contrary, human processes the inputs and a functional transformation (for ex. from visual to semantical) happens.

2. Processing information requires time. The time that passes between the moment input comes and human responses is called the reaction time.

3. The mental timing of events that happen in a single response process. The nomenclature of the stages, durations and the definition of operations or transformations done in each stage.

4. Transformations related to the presentation of information.

5. Limits that do exist in the time and quantity domains.

6. The unit of information. Miller's seven plus/minus two rule is alluded above in the working memory. This also points at the effect of the gained experience on the size of chunks and thus determines the perception speed.

Today, all sorts of references to this model, are not limited to engineering books as it should. Many other psychology related books refer to this model or at least have similar approaches although this model is created primarily for guessing the response time of the human to certain systems.

In this model, there are visual and auditory image stores in the short term perception memory. When we think of memory we tend to imagine a single area or even a single organ. In fact, our brain is composed of many sub-structures and sub-functions, or sub-processors as in the computer nomenclature. The visual store should be located somewhere related to the visual part of the brain and auditory memory likewise.

Wickens model states that any information written into the longterm memory is never erased. This does not mean that, that information is accessible. Commonly established belief is 'our memory works linearly'. On the contrary, experiments have shown that we can remember some parts of the past better than others. For example, we may remember 30-40 year old events better than closer events in the past. Our memories do not work linearly on the time basis.

Our memories have an addressing mechanism which is triggered by content. Human memory is a marvel on one hand and an enigma on the other because of its non-linearity. The complexity of social events may be explained by the complexity of the minds of people who create them and the way their minds work. Writing to the memory and access to it is determined not only by content but also the environment, the mood, etc. Our memories' refreshing mechanism is also not linear. It is a scientificly proven fact that a person who remembers a bad event in the past tends to remember bad things after this. An other example for the content triggered addressing mechanism is the fact that we can remember things related to ourselves better than other things.

The basic speciality of the Wickens model is the transformation of the information's presentation format. For example, a figure percieved by the eye is stored in the visual image store in the physical format but transformed to the visual format when passed to the working memory.

It is the most reasonable approach to assume that these physically percieved information are accessed in the working memory through some buffer zones. This also implies that the working memory does not have a homogenous function as commonly assumed. The saying that people working under heavy mental load 'can not see or think anything else than their work' has a piece of truth in it. The increased mental load causes temporary changes in the memory usage. These people become forgetful or get easily distracted when doing even simple daily things. The reduction of perception abilities of people working under heavy mental load can be attributed to the reduction of input buffer space by the working memory to increase space for logical etc. cognitive tasks.

A common misunderstanding in the society that is fostered by the Wickens model is that human memory is a uniform single structure. For example the episodic bellek which is located in the frontal part of our brain is a special memory that helps to form the sense of time and reality. Episodic memory keeps track of events and provides information about sequence, duration, reality to the general use of our brain. People who work under heavy mental load frequently forget what they have done. They first take a book from the table and put it on the bookshelf, then a few moments later they forget what they have done and try to put the book on the shelf again, thus they can not find it on the table. While working at EUROCONTROL Software Team Karlsruhe, Chritian PETIT who was working on a difficult task in a terrible political climate had told me 'This is a natural situation, I can not remember the color of the traffic light after I pass them while driving' as an answer to my similar complaints.

If we study this example closely, with the assumption that the episodic memory has a buffer; the events that have happened should have been written to the buffer in their happening sequence. If the working memory is overloaded during the events, the memory allocated to the episodic memory buffer is deallocated and put in the service of general purpose or other working memory. As a result of this the working memory allocated to the episodic memory buffers is cancelled or dramatically reduced. In this case, the mentally overloaded person can not remember an event which has happened a few moments ago, because the episodic memory input buffer related to that event has been erased and used for some other purpose.

An other example to the case of mental overload reducing the perception is: a person driving an automobile, airplane or any system loses control of command due to the increase in his reaction time caused by mental overload(mostly talking). A special case related to this situation is air traffic controllers making mistakes while working with divided attention (Investigating Controller Blindspots, Dr. Barry Kirwan, HINDSIGHT 5 - July 2007). When dealing with a difficult situation with a relatively calm background , the controllers have to focus on the high priority troublesome situation but after fixing this problem they should remember the cases in the background. Unfortunately in some cases it has been observed that after the primary problem is solved, some of the secondary problems related to the general situation have been completely forgotten and thus they have caused other important problems. The problem is the same as in the example of Ray EBERTS's, User Interface Design book of a driver not hearing the radio when the traffic gets dense. I believe, the problem is not inability to percieve but the insufficiency of working memory resources(input buffers) which enables the resolution of the perception process in the consciousness.

Let's study the hypothesis of mentally loaded person's perception deficiency reversely. A person whose perception is heavily loaded should have reduced or weakened cognitive(logical, decision making etc) functions. Let's imagine a commando soldier in a commando exercise as a person whose perception is heavily loaded. Fast moving targets appear suddenly or move in front of him during the exercise. The soldier is expected to fire and hit the targets with his reflexes rather than think and make decisions cognitively. Balthazar GRACIAN alludes to an old addage in his 'The Art of Worldly Wisdom'. 'It is difficult to make decisions when driving a horse'. The more the percieved things, the more buffers for different inputs. If you continue to increase the inputs even more, wrong actions produced by making decisions based only on reflexes rather than judgement appear. We end up with incidents such as the 1992 incident when an American pilot fired at an helicopter which carried American and Turkish officers.

An other aspect of this subject is how much should the system user be loaded when designing complex screens such as radar displays. Displaying every information spatially makes the access to them easy but the designers' general tendency is to abuse this principle. The requirements creep also fosters this tendency. The output of these wrong tendencies is visually overloaded screens. The overloaded screens is developing at the expense of losing and leaving the judgement ability of the large systems or air traffic controller out of function. The large system controller is turning out to be a simple sensor that reacts rather than judges and decides.

Contrary to this phenomenon, Situation Awareness should depend on human mind's variable thinking depth, variable thinking speed and ability to think with things it does not know or remember, its multi-processor pseudo-god control ability which directs its conscious-subconscious balance.

I tried to drive your attention to the common misbeliefs about the human mind. Besides this, I outlined the popular Wickens Model and noted some misunderstandings about it which reduces the system user to a simple sensor. I hope to be pondering on thinking speed vs thinking depth, the balance between conscious and subconscious and mental control vs automatic processes in my future articles.

An antique Hellenic philosopher has said 'Know yourself'. A weak point of this adage is that the person or anonym persons who used this adage have at least a single self. The Anatolian-Eastern tolerance of Mevlana, although not that old, reflected in the adage 'There is a self in myself' would perhaps say 'My son, be aware of yourself from time to time without any intention to do so and do not forget to feel your poor body once in a while'.

'May your mind be fresh and be all the rest nice'.

Ali R+ SARAL

Note: Besides serving the benefit of the general public, has this article been written to be used in the education of air traffic controllers, large system operators and the engineers.

<title>Too Much Attention May Cause Forgetting</title>

Focusing on a certain thing may cause other things to be forgotten for sometime. After relaxing the focus one may find nothing left from the forgotten things. This may be detrimental where a large systems controller has to return back to handle the normal workload after a critical problem is solved[1,2,3].

Forgetting is inherent in the nature of focusing. selective attention and behavioral inhibition are two sides of the same coin: Attention is the effect of biasing competition in favor of task-relevant information, and inhibition is the consequence that this has for the irrelevant information[4]. It is inevitable that irrelevant things will be forgotten when one focuses.

Once focused, brain tries to keep its focus till the goal is achieved.
PFC must maintain its activity robustly against distractions until a goal is achieved,[4]. This also makes it impossible to maintain other things in the current memory.

The brain maintains our goals and rewards. The aim of the cognitive system is not only to predict reward but to pursue the actions that will ensure its procurement[4].

Setting clear goals and rewards helps to succeed in the current task but increases the exclusion effect of the forgotten current memories. The existence of a reward increases the forgetting effect tremendously.

Many drivers have experienced forgetting the portable parking sign and driving on-hitting it. It is sometimes distraction... But other times when there is no distraction, it is because you have hurry to reach somewhere and you focus all your skill and ability to get out of that narrow parking lot. Too much focusing is not good. Focusing should be proportionate with the task ahead + should have some leeway.

When there are other people in the car the German saying may help: 'The car is driven not only by the driver but by all the passengers'. There are situations when the large systems operator must really focus his effort. In these situations a copilot, disributed processing of a team serves to replace the forgetting effect.

Unfortunately there are some cases that there exists only one pilot or the ATCO is alone for a short moment etc. In this case, time related intention may be set by the same person. If his volition is in perfact shape, he will automatically remember the waiting tasks as soon as he completes the emergency case. This requires a healthy balance and cooperation between the subconscious and conscious of the operator(I will make a few comments on this later).

Ali R+

Refs:

[1] ICAO -Threat and Error Management (TEM) in Air Traffic Control

PRELIMINARY EDITION - 2005
...
9. ATSP External Threats
9.4.1 Controllers from adjacent units may forget to coordinate traffic,

[2] Steven T. Shorrocka, Barry Kirwanb: Development and application of a human error identification tool for air traffic control; EUROCONTROL Experimental Centre, BP15, F91222, Bretigny Sur Orge, France, February 2002
...
(i) Perception: errors in visual detection and visual search, and errors in listening.
(ii) Memory: forgetting (or misrecalling) temporary or longer-term information, forgetting previous actions, and forgetting planned actions.
(iii) Judgement, planning and decision-making: errors in judging aircraft trajectories, errors in making decisions, and errors in planning.
(iv) Action execution: actions or speech performed notas-planned.
...
Memory: Controllers could forget to issue a planned instruction (e.g. FL or heading) after a distraction, or may forget received information. Reduced separation generally allows less time to address resulting situations, and places more demand on the pilot to sight traffic or request and implement avoiding

action. Other errors of memory could include forgetting to check the position of traffic previously observed at long range. With reduced separation minima, it is possible that controllers could delay such checks, knowing that traffic will take more time to cover the distance to separation minima.

[3] Thomas Bove: Development and Validation of a Human Error Management Taxonomy in Air Traffic Control, November 2002
...
type of unintended actions and involve memory failures. Such memory failures can manifest themselves through, for example, forgetting planned items or forgetting intentions.

[4] Earl K. Miller(1), Jonathan D. Cohen(2): AN INTEGRATIVE THEORY OF PREFRONTAL CORTEX FUNCTION
(1)Center for Learning and Memory, RIKEN-MIT Neuroscience Research Center and Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology,Cambridge, Massachusetts 02139; e-mail: ekm@ai.mit.edu
(2)Center for the Study of Brain, Mind, and Behavior and Department of Psychology, Princeton University, Princeton, New Jersey 08544; e-mail: jdc@princeton.edu

<title>THINKING SPEED</title>

University entrance exams in Turkey or TOEFLE, GRE exams measure mathematics, social, science, Foreign language knowledge and specific skills. It is not enough to know by itself, the person who answers more and correct win, so the person who thinks fast wins.

Every person has moments, hours, days even months that he or she thinks faster than normal. In the months of spring and autumn, specially in September and October, as if God motivates us for the approaching difficulties of the winter, drives us to think faster on the average.

The fast thinking person evaluates events deeper with his/her increased brain energy, real or not, true or false he relates things more and remembers more things 'related' to the subject.

If the thinking speed continues to get even faster, digressions to subjects more distantly related to the topic may increase. If the effects of thinking speed increase remains as much as excessive sensitivity, loss of concentration while driving, its affects remain limited by effecting the content of thinking process and the personal success.

Pronin and Wagner wrote about their experiments that showed thinking speed effects mood in their article Manic Thinking - Independent Effects of Thought Speed and Thought Content on Mood of 2006. High thinking speed creates and elevated feeling, happiness etc., and in some cases a subjective selfconfidence and grandeur.

Similarly, Winkielman et all. states that high fluency in information processing, for ex. listening to a fluent and easily understandable message, causes the message to be percieved more positive than it

really is. 'Generally speaking, high fluency indicates things are positive, and low fluency negative.' This ability, given by the creator to us, is named as 'marking the data hedonically' or 'hedonic marking'.

Perceptional fluency, as in the fluency of advertisements, triggers the feeling of positive appraisal. Fluency signal is formed at the very beginning of the input signal. Fluency signal constitutes the best reference when there is little information that can be drawn from the input signal. People sometimes prefer the new, complex and surprising arousal signals to simple and known signals because of this. Thinking speed is an important element in the management of peoples preferences.

Intentionally or not, each person utilizes his/her thinking speed for own purposes by his/her own. Being able to do extraordinary things in emergency situations can be attributed to the skills God has given as much as the individual abilities he/she possess. Human mind and body works with a higher speed in emergency situations.

Even in normal situations, we increase our thinking speed to overcome the difficulties we are faced. Concentration is to handle everything ve percieve and think from a certain reference point. Focusing is to limit our whole thinking capacity to a singel subject and cognitively process things only within that region. In each of these cases, we leave some part of our brain's neural network out of functioning and pump blood to only regions that are related.

Another way that we regulate our thinking speed is 'to feel an emotion.' Emotions affect the signal propagation and its conditions in the brain via the hormones that trigger them and the hormones the emotions, themselves trigger in response. This situation affects and changes the threshholds that determine the decisions. For example, a driver under the effect of the early days of spring, takes more risk than he does under normal conditions, or political activists participate in higher risk actions. Just imagine that all the threshholds of a society changes approximately at the same time of the year. This also functions as a unique window of opportunity for change and novelties in the human society which is inherently conservative and conformist.

I believe, thinking speed should be proportionate with the thinking energy. In his □Sketch for a Theory of the Emotions□, Sarte says, 'if one can not handle a situation with his cognitive abilities he then transforms his □psychic energy□, he becomes afraid.' The increase of thinking speed, should be one of the ways to decrease the psychic energy, I believe□ The increase of thinking speed, causes the appearence of our abilities such as imagination, planning, obsession, that help us to manage the difficulties that we are faced with.

Our ability to be successfull is not solely determined by our cogitive abilities. An affective maturity which nourishes, manages and sustains its cognitive abilities is also required. This is necessary for the success of a team as well as a single person, from the point of Crew Resource Management.

In an airplane accident at USA, the dispatcher send the airplane into a region with bad weather forecast, to land in a certain opportunity window. The plane hits the ground. The investigation shows that the copilot effects the pilot decision positively in every and each decision he has made, like 'No problem we will make it or it's OK we will land!' In fact, the pilot and the copilot should have acted as parts of an

unity. While the captain was open to the effects of the surroundings and the aircraft, the copilot should be adjusting his affective situation and regulate his decision threshholds. The problem in this situation was the copilot did the adjustment not so well.

In our country too and unfortunately there have been quiet a few accidents in which pilots became martyrs landing in bad visual conditions etc To reduce these cases, maybe, we should look at Barbara E. HOLDER's Phd Thesis once more:

A dominance interaction occurs when one pilot does everything processes instrument representations, speaks, acts, decides, without assistance or concurrence from his partner. The other pilot tends to remain a passive partner even if he was not passive before. This pattern is often characterized by a unidirectional flow of representations centering on one pilot. Pilots construct an understanding of the situation independent of
each other and the understanding of the dominant pilot may sway the understanding of the other pilot. Communication between pilots tends to be one-sided flowing from the dominating pilot to the other pilot with little or no opportunity for negotiation and discussion.

I am afraid, our people's dominant character which has made our country run from victory to victory is being evaluated as a single 'pilot's mistake' in the current airplane accidents or at least is being pronounciated as such...

Holder has prepared her thesis by attending sea helicopter trainings and has recorded the trainings of other people in helicopter simulators. She has interesting comments on the effect of pilot copilot rank relations. After everything is explained about the Isparta accident and when precautions are being discussed this rank issue could be pondered upon. It is possible to find Holder's thesis on the internet.

I have studied the God given ability of thinking speed and its application from the individual, social, economical and aviation applications in this article. I have pointed at the relation between thinking speed, psychic energy and emotions. I would like to ponder on the transformation of psychich energy to thinking speed as in imagination, planning and affections in my next articles. The conversion of imagination to dreams, day dreams and sleep etc The role of the sense of time in this etc

<title>The Effect of Feelings on Concentration</title>

This is about the effect of feelings on focused attention and concentration. There is a difference between focused attention and high concentration. Focused attention requires the use of attention resources for a very limited area or task. Concentration is different from focused attention. Concentration does not exclude whole areas of interest unless they can be linked to the subject at one or other level of abstraction. That's why we talk about deep concentration but not deep focusing.

The effect of feelings, namely getting sentimental or a certain affective mood during a task may have certain effects to the quality of the work done. These effects may be positive in the short term as increasing motivation under /against too much load. They may be negative as the effect of an airplane

accident on the air traffic controllers who must still continue to control the remaining hundreds of aircrafts in the air.

Feelings control the thinking speed hence control the depth and establish the context of thinking. Thinking speed is a commonly used term but diffrent hormones effect different parts of the brain and may cause working speeds in those regions. It may not be wise to use thinking speed in place of a global brain speed performance as in CPU speeds of the computers. I refer to the cognitive processing speed of the brain when I mention thinking speed. It is also interesting to question what exactly thinking speed means. Is it the propagation speed of signals in the neural networks via chemical reactions? Or is it the inverse of the resolution duration of a minimal decision taking in the neural networks?

There certainly exist time frames in the brain processing which establish time limits for the propagation of signals in the neural networks. These time limits may be set by hormones which control the chemical conditions that in turn control the propagation conditions in these networks. Feelings effect the hormon production and flow in the body. Hence feelings effect our cognitive abilities, namely decisions.

Speaking of thinking speed, one must not forget the dynamic character and differentiate between minimal and major variations. The effect of minimal variations may be positive on the thinking performance while the reverse on major variations. Also, one must consider the gradual and sudden changes. The effect of gradual changes may create complex situations such as the loss of the situational awareness in pilots while making smalltalk with colleagues. The effect of sudden changes may be good when the operator is well trained and can control the extra influx of the hormones to increase his performance in emergencies.

Last but not the least, the feeling of taste is the key to understanding feelings as much as seeing for understanding cognition. Tasting sets the way to feeling and seeing to thinking, developmentally and evolutionarily.

<title>ABSTRACT (1)</title>

ABSTRACT

1 a : disassociated from any specific instance
b : difficult to understand : ABSTRUSE
c : insufficiently factual : FORMAL

2: expressing a quality apart from an object

3 a : dealing with a subject in its abstract aspects : THEORETICAL
b : IMPERSONAL, DETACHED

4: having only intrinsic form with little or no attempt at pictorial representation or narrative content

TO ABSTRACT
1: REMOVE, SEPARATE

2: to consider apart from application to or association with a particular instance

3: to make an abstract of : SUMMARIZE

4: to draw away the attention of

Origin:
Medieval Latin abstractus, from Latin, past participle of abstrahere to drag away, from abs-, ab- + trahere to pull, draw

First Known Use: 14th century

Source: Merriam - Webster Online
http://www.merriam-webster.com/dictionary/abstract

<title>A Short Outline of Automatic motor activation in the executive control of action</title>

For various performers on
the field

[1] Automatic
and unconscious processes are traditionally regarded as inflexible (e.g.,
Shiffrin and Schneider, 1977, 1984), quite distinct in quality from the
flexible nature of □voluntary□ processes. However, there is increasing evidence
that automatic and subliminal processes can in fact be modulated by □top-down□
processes of attention, intention (□task set□ or current goals) and
expectation.

[2] DISSOCIATIONS IN
AUTOMATIC AND VOLUNTARY CONTROL

Recent
work from Boy et al. (2010b) suggests that the important distinction is not
between control that is automatic compared to control that is voluntary, but
rather between poststimulus

[3] PRE-STIMULUS VS.
POST-STIMULUS COGNITIVE CONTROL

Control
mechanisms that can override inappropriate response plans which have been automatically evoked by the environment not only act to inhibit responses they have been evoked by the stimulus. control
mechanisms also seem to play a role. Thus, task set and previous experience can modulate conflicting response tendencies in a

[4] EVIDENCE FOR
AUTOMATIC ACTIVATION OF MOTOR RESPONSES

Perceptual processing of a visual stimulus can
result in motor responses even when the observer does not intend to act. One of the most well-studied of these phenomena is the visual grasp reflex, where an observer makes a fast, reflexive eye movement (saccade) toward a suddenly appearing and irrelevant visual stimulus, despite their intention to look elsewhere (e.g., Theeuwes et al., 1998; Irwin et al., 2000). ... But as response latencies increase, saccades are more likely to curve from a distractor (e.g., Walker et al., 2006), revealing an inhibitory mechanism acting to suppress unwanted motor activity toward the irrelevant stimulus (e.g., Sheliga et al., 1995).

[5] EVIDENCE FOR
AUTOMATIC MOTOR ACTIVATION FROM PARTIAL ERRORS

However, it is possible that small amounts of
force applied (erroneously) to a button might be insufficient to trigger a measurable response and thereby escape detection. ... trials provides strong evidence that an irrelevant stimulus or part of a stimulus can automatically activate responses associated with it. These responses are not merely partially activated somewhere in the brain; the response can be measured in the muscles or in small hand movements with force transducers.

[6] INVISIBLE
INFLUENCES

In summary, shifts of attention and motor
responses can be automatically and unconsciously triggered by visual stimuli. Effects of non-perceived stimuli such as these have provided key evidence that

visual stimuli can automatically prime the observer to act.

[7] INHIBITION OF PRIMED ACTIONS

Thus, it is necessary to consider how brain systems inhibit or override responses that have been triggered automatically by the environment and are not relevant to our current goals....Processing by the fast, direct processing route is automatic, and occurs irrespective of task instructions . For example, the spatial location of a target stimulus in a Simon task would be processed quickly and automatically via the direct processing route. At the same time, processing of the task-relevant target attribute (e.g., target color in a Simon task) proceeds via a slower . On congruent trials, the same response is activated by both the direct and the indirect processing routes, producing fast, correct responses. On incongruent trials, however, the direct processing route and the indirect processing route activate different responses which results in increased error rates, and slower response times as the conflict between competing responses is resolved.

Importantly, models of information processing in conflict tasks often include an active inhibition mechanism which acts to selectively suppress inappropriate response activation resulting from the direct processing route...

In conflict tasks, accuracy for compatible trials is near-perfect, while fast responses on incompatible trials are often near (e.g., Wylie et al., 2009) or below (e.g., Stins et al., 2007) chance level.

that erroneous responses are activated quickly via the direct processing route, before being selectively suppressed by an inhibitory control mechanism.

[8] UNCONSCIOUS CONTROL OVER UNWANTED RESPONSES

inhibition of primed responses only operates
when stimuli are presented above and not below the threshold required for
conscious awareness (e.g., Merikle et al., 1995 using the Stroop task). However, when the interval between prime and
mask was extended beyond around 100-150 ms, incompatible trials produced faster
responses than compatible trials. In other words, the usual priming effect had (NCE) has now been widely
reported with button-press responses, foot responses, and eye movements

... Many
researchers have suggested that this reversed priming results from an
inhibitory mechanism in the motor system which acts to suppress sub-threshold
motor activation evoked by the prime

[9] AUTOMATIC
INHIBITION IN THE AFFORDANCE PARADIGM

visual
stimuli automatically evoke motor responses, Overall, these studies suggest
that actions which have been automatically primed by object affordances may
also be subject to automatic control.

[10]
AUTOMATIC TRIGGERING OF ENDOGENOUS CONTROL

However,
recent work suggests that endogenous suppression of pre-potent responses can
also be primed or evoked unconsciously and automatically (e.g., Verbruggen and
Logan, 2009a; van Gaal et al., 2008, 2009, 2010a,b).

[11]
AUTOMATIC PRE-STIMULUS CONTROL

Many
researchers have suggested that observers must consciously experience conflict
in order for the pre-stimulus control mechanisms to be deployed (e.g., Kunde,
2003; Mayr, 2004; Ansorge et al., 2011). However, recent evidence from van Gaal
et al. (2010a) suggests that some pre-stimulus control can be evoked
automatically, without conscious awareness. ...unconsciously presented stimuli
can automatically evoke these pre-stimulus conflict adaptation mechanisms, and
can modulate the effects of subsequent conflicting stimuli.

[1] Jennifer McBride1*, Frédéric Boy2, Masud Husain1 and
Petroc Sumner2 ' Automatic motor activation in the

executive control of action
1 Institute of Cognitive Neuroscience and Institute of
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<title>NIGHT VISION: A PEDAGOGICAL METAPHOR for AVIATION</title>

'Autokinesis' is a special visual hazard of night flying. When you look constantly at a small point in a dark night, you feel as if the light is moving, after a while. Otherwise, you may feel as if yourself is moving.

'Autokinesis' is only one of the discrepancies that we carry everyday without ever being aware of. Our discrepancies may appear not only at the edges of our abilities, such as night vision, but also in our routine daily activities. The sooner we get aware of them, the better the quality and fulfillment of our lives.

Unfortunately, we are created not to improve our abilities but primarily, to survive with them.
In any form of life comes improvement after survival. Our bodies, namely the embodiment of ourselves [1] is designed so that even if we loss some part of us we should survive.

Even if we lose an arm, after feeling the immediate shock, we should be able to continue our lives, together with a prosthetic device, and even feel as if we still have the lost arm in our minds as in some cases[2]

I believe, a mental, behavioural discrepancy can and may become a part of ourselves, and our mental embodiment similar to a prosthestic device A discrepancy may become part of our 'subjective' mental body till something happens and brings our attention to it, thus this discrepancy becomes our 'objective' mental body.

The problem is that, the transition from the subjective mental body to the objective one may cause pain and also damage the complex relations of choices a person has made to build his/her personality.

In "Cognitive linguistics" href="http://en.wikipedia.org/wiki/Cognitive_linguistics" , conceptual metaphor refers to the understanding of one idea, or "Conceptual domain" href="http://en.wikipedia.org/wiki/Conceptual_domain"" in terms of another, for example, understanding "Quantity" href="http://en.wikipedia.org/wiki/Quantity"" in terms of "Directionality" href="http://en.wikipedia.org/wiki/Directionality" (e.g. "prices are rising").

[4] Using metaphors in psychological training of air traffic controllers, engineers and other aviation personnel, could be an effective pedagogical approach. Rather than doing not much while waiting for who is going to fall down

If we return back to the night vision; 'night flying requires a different visual technique than day flying' [5]. In daylight you have to look directly at the target object. At night, you have to look at slightly one

side of the target object. Scanning the target by moving your eye permits □off-center□ viewing. You should not look directly at the target object at night unless there is a special reason.

'The explanation for this lies in the DUAL STRUCTURE OF OUR EYE'[5]. The cones work in day light and the rods at night. The rods are located on the periphary of a circle around the cones.

The cones need a greater intensity of light to function, and stop working in semidarkness.
The rods can function in 1 / 5000 th of light intensity. The rods are 100000 times sensitive in dark as they are in light. So, they work at night.

The problem is; what do the rods do in the day light? The rods provide a grey scale view, while cones provide coloured□ Rods lose their sensitivity after short exposure to light. This means less sensitivity is used only for percieving objects in the peripheral view□

My point is, the night vision metaphor may be used for teaching Obsessive Compulsive Disorder (OCD) awareness for aviators. OCD is a common problem among people working with risk.
It may be just a behavioural nuisance that can not be noticed or an increasing mental risk towards more serious situations. You have to be aware of what the people around you are doing, in order to warn them and not get affected by them.

Henry Szechtman and Erik Woody 's article □Obsessive-Compulsive Disorder as a Disturbance of Security Motivation□ describes OCD as:
□We hypothesize that the symptoms of obsessive-compulsive disorder (OCD), despite their apparent non-rationality, have what might be termed an □epistemic□ origin - that is, they stem from an inability to generate the normal □feeling of knowing□ that would otherwise signal task completion and terminate the expression of a security motivational system.[7]□

Similar to the Night Vision mechanism of the eye, Security Motivation System is 'hardwired'. It is highly tuned to certain kinds of input like the cones and rods working on different light intensities.
Probably much more complex than eye's night vision mechanism, is the Security Motivation System also □automatic and autonomous, and □encapsulated,□ or relatively isolated from information developed by other systems.□

The Night Vision metaphor provides a good example for teaching:
1. There are seperate resources in our mind and brain for different tasks.
2. There has to be an activation and stopping mechanism (homeostatic) for any resource.
3. There may be a switching mechanism which manages the processes related to different and competing tasks.

Moods, emotions, thinking speed in different situations may effect the switching mechanism and activation - deactivation mechanism of our minds and brains[8]. Selecting the right mood and time frame helps the team make the right decisions with the right mental resources.

Ali Riza SARAL

[1] Phenomenological theorists distinguish between the subjective body(as lived and experienced) and the objective body (as observed and scientifically investigated). My lived body is an EMBODIED CONSCIOUSNESS which fluidly and pre-reflectively engages the world. As we engage in our daily activities, we tend not to be conscious of our bodies and we take them granted - body that is passed-by-in-silence (Jean-Paul SARTRE, 1943, Being and Nothingness).

[2] Prothestic devices stretch the boundaries of the body. They create a continuity beyond the limits of the skin(Carolien HERMANS, 2002, Embodiment: the flesh and bones of my body). A body schema works on a subconscious level. It registers shape and posture of the body(without coming to awareness). It makes a record of the momentary relative disposition of one's own body parts. Prothestic devices can be absorbed in the body schema. Just as a hammer in the carpenter's hand is incorporated into his body schema, any virtual body part or interface(keyboard, mouse, joystick) can become part of the schema in a temporary or longlasting way

[3] For further reading: Embodiment and Man-Machine Interaction
href="http://largesystems-atc.blogspot.com/2007/07/embodiment-and-man-machine-interaction.html"

[4] Wikipedia, href="http://en.wikipedia.org/wiki/Conceptual_metaphor"
Night flying requires a different visual technique than day flying. You can see an object best during daylight by looking directly at it. At night, however, a scanning procedure is more effective - to permit "off center" viewing of the target. In other the words, you will find after some practice that you can see things more clearly and definitely at night by looking slightly to one side of them, rather than straight at them.
The explanation for this lies in the dual structure of your eye. There are two kinds of light-sensitive nerve endings at the back of your eye: (1) the cones, which distinguish colour and require considerable light to function, and (2) the rods, which detect objects only in shades of grey but can operate in very dim light.
The cones, because they need greater intensity of light to function, are used in day vision. In fact, the cones stop working altogether in semi darkness. Millions of these tiny structures are clustered at the back of the eyeball, directly behind the pupil. Not only do they distinguish colours, they pick up distant objects.
The rods are concentrated in a ring around the cones. Being colour-blind, they see only in greys and are used in peripheral vision during the day - that is, to perceive objects in motion out of the corner of the eye. Because the rods can still function in light of 1/5,000 the intensity at which the cones cease to function, they are used for night vision. These structures are 100,000 times as sensitive in the dark as they are in sunlight. However, they do need more time to adjust to darkness than the cones do to bright light. Your eyes become adapted to sunlight in 10 seconds, whereas they need 30 minutes to fully adjust to a dark night.
The fact that the rods are distributed in a band around the cones, and, therefore, do not lie directly behind the pupils, makes "off centre" viewing important to the pilot during night flight. If, in your attempts to practice the scanning procedures mentioned previously, you find that your eyes have a tendency to swing directly toward the target, force them to swing just past it so that the rods on the opposite side of the eyeball pick up the object.

Rods lose their sensitivity after short exposure to a light source, but regain it quickly after a moment of "rest." Consequently, a prolonged blink may be enough to renew the effectiveness of your vision if you are simply using the "off centre" technique, without scanning. Remember, too, that rods do not perceive objects while your eyes are in motion, only during the pauses.
AVIATION MEDICINE, Night Flight,
href="http://www.pilotfriend.com/aeromed/medical/night_vision.htm"
Helicopter Flight, href="http://meanwhile.com/?domain=helicfi.com"

[6] Ali Riza SARAL,
Kapanmayışlar, href="http://largesystems-atc.blogspot.com/2007/01/kapanmayilar.html"
Kapanışlar, http://largesystems-atc.blogspot.com/2006/11/kapanilar.html

[7] The psychological experience of compulsion is not well defined (Reed, 1985, p. 119), but nevertheless one can conceive of two broad mechanisms that would produce the intrusiveness and urgency characteristic of OCD symptoms. One is a pathological intensity of excitation of the particular thoughts, ideas or actions. The other is a relative failure of the systems that normally terminate such thoughts, ideas or actions.

Security Motivation System - Such modular systems are innately specified and hardwired, highly tuned to certain kinds of input, comparatively automatic and autonomous, and encapsulated, or relatively isolated from information developed by other systems.

2. The system is readily activated, responding to even a slight chance of danger, and once activated, it has a long half-life, being slow to deactivate despite changes in the environment that feed into the appraisal process (Curio, 1993; Marks & Nesse, 1994; Masterson & Crawford, 1982). This easy-to-turn-on, hard-to-turn-off quality makes sense evolutionarily, because repeated false alarms are much less costly than even a single failure to prepare for upcoming danger.

Similarly, we hypothesize that an internally generated feeling of knowing provides not only a phenomenological sign of goal-attainment but is also the physiological mechanism that actually shuts-down security motivation.

An internally generated feeling of knowing (termed yedasentience) provides a phenomenological sign of goal-attainment and has as its consequence the termination of thoughts, ideas or actions motivated by concerns of harm to self or others. Failure to generate or experience this feeling produces symptoms characteristic of OCD.

Instead, according to the present model, the underlying problem is lack of closure -- the inability to turn off security motivation, which drives security-related thoughts, through the normal route of performing specific security-related behaviors.

Henry Szechtman, McMaster University, Erik Woody, University of Waterloo, Obsessive-Compulsive Disorder as a Disturbance of Security Motivation, href="http://inabis98.mcmaster.ca/reprints/MS02-082.pdf"

[8] The mechanics of the thinking process is affected by our emotions. Switching from one context to another, the rate of changing subjects, the amount of concentration, the depth of thinking through different abstraction levels, getting obsessed to solve the problem, thinking speed are dramatically affected by the affective situation we are in while thinking The various glands of the endocrine system release hormones into the bloodstream that have effects on specific sites in the brain, including those involved in emotion says Cornelius [5] . A careful observer can notice that there are different working speeds of thinking in our brains. Our brains work in a slow mode when we are doing something related with safety or security(but not related to emergency) where as our ideas fly when we are doing something sentimental or dreaming Thinking speed helps us to switch from one processor to another in our multiprocessor brain. Feelings and selecting the right mood help us to choose the right processor (or combination of processors) to do the 'thinking'.

Ali Riza SARAL, Do Computers Feel?,
href="http://largesystems-atc.blogspot.com/2007/12/do-computers-feel-1500words.html"

[9] Gavrus BOGDAN, Vizual,
href="http://gavrusphoto.blogspot.com/">http://gavrusphoto.blogspot.com<

<title>DO COMPUTERS FEEL? (3000 words)</title>

To Dr. David Williams of ORAT-ISU

Does computer feel? Does computer have emotions? Does computer feel joy, love, anger, fear, happiness, guilt, sadness, embarressment, hope and many other emotions? Is the effect of the feelings of computer on its behaviour pleasent or unpleasent, mild or intense, transient or long-lasting, and as interfering with or enhancing [1] ? Do computers 'experience emotions'? Do they react toward things in the environment that have such emotional qualities as frightening, cheering and saddening?

Dewey [2] defines emotion as a composition of (1) a feel (the feeling of fear, pride, humility, etc.), (2)purposeful behaviour (3) an object that has an emotional quality. He describes the so-called expressions of emotions as 'the reduction of movements and stimulations originally useful into attitudes. These reductions are grouped as servicable associated habits, analogous stimuli, antithesis, and direct nervous discharge.

Hume [3] states pride and humility, tho' directly contrary, have yet the same object. This object is self, or that succession of related ideas and impressions, of which we have an intimate memory and consciousness. the passions either take place alternately; or if they encounter, the one annihilates the other, as far as its strength goes, and the remainder only of that, which is superior, continues to operate upon the mind. we find, that a beatiful house, belonging to ourselves, produces pride. a quality I discover in these passions is their sensations, or the peculiar emotions they excite in the soul,

and which constitute their very being and essence. Thus pride is a pleasent sensation, and humility a painful; and upon the removal of the pleasure and pain, there is in reality no pride nor humility.

Schachter [4] states an emotional state may be considered a function of a state of physiological arousal and of a cognition appropriate to this state of arousal. The cognition, in a sense, exerts a steering function. Cognitions arising from the immediate situation as interpreted by past experience provide the framework within which one understands and labels his feelings. It is the cognition which determines whether the state of physiological arousal will be labelled as anger, joy, fear, or whatever.

Many more definitions of emotions have been made through the history beginning with 2nd century BC, Aristotle. Descartes, Spinoza, Hume, Darwin, James, Cannon, Dewey, Schachter, Singer, Freud, Brentano, Scheler, Heidegger, Sarte and many others Hoping to have enticed you to a wonderful journey in these precious people's works I would like to repeat my initial question once more...

Do computers have an 'inner' sentimental world? Too difficult to answer quickly May be we should change the question a bit Does any being except the human have feelings? Maybe the better: Do animals have feelings? In his 'The Expression of Emotions in Man and Animals,' Darwin writes most of the expressions and gestures involuntarily used by man and lower animals, under the influence of various emotions and sensations. You can find Some of Darwin's illustrations of familiar emotional expressions in animals [5] in Cornelius's book 'The Science of Emotions'.

None of the animals can speak like us. Neither can they say I feel sad. Nevertheless, when a cat or a bird approaches a person sitting at a garden caffee, it bends its head to the ground and imitates as if it eats something. A careful observer or a tender person with compassion understands or feels that the animal needs food. Animals can communicate their needs. The problem is, most of us do not percieve the messages they are able to give. We do not get nervous in front of a loud speaker playing music but many get afraid when a dog says simply a'hello' just using his very limited vocabulary and powerful vocal tract.

We should not judge neither animals nor computers as insensitive because they can not express themselves with the same emotional vocabulary as us the human-beings. In order to percieve whether computer has feelings or not its emotions have to be easily percievable by us, namely we should share more or less the same 'feels' with computers as in animals. We can not percieve the emotional expressions of computers easily.

Does this situation provide enough validity to the claim that 'Computers do not feel'? Is there something wrong here ethically? Do we loss anything because of this silent assumption in our relations with computers? Are the Human Computer Interaction classes in many universities well equipped or even down-played as not technical enough? Why do many engineers and large system operators suffer from long duration high concentration jobs in front of their computers?

Indeed, computer does not have a face. A face like a human or even a mammal. It does not have eyes, ears, a skin, a head or a body Wait a minute Are you sure? Are you sure that computers can not see, hear or touch? What about scanners, microphones, keyboard, power-on button? Don't they provide

the similar functionality as eyes, ears, skin Computers do have many functionalities that basic human senses provide.

Computer has a head, that you can look into its face, namely the monitor, or a body that supports its being, namely the case or box that contains the mainboard. The problem is that they do not appear to our eyes as we are conditioned to see as a head or a body Microsoft has invented a solution to this problem They have a sweet doggy appearing at the side of the directory search. The doggy itches the ground or searches something in a book It can express curiosity because it has a face Microsoft uses the dog image to express the emotions of the computer during directory search. It has a healing effect on the user It makes the user smile and lose concentration for a short while

* * *

The crux of the issue of 'Do computers feel?' is: Is it possible to think without feeling? Can cognition exist without emotions? The pith of the matter is this. Can you think even mathematics without feelings? Can you study mathematics without feeling anything? Even if we assume that you really did not feel anything while solving a problem, but after that you will need to discharge the unused mental energy in some way. Besides, you will experience pride or humility depending on your success.

Even if you have become a great 'professional' who has the power to control everything, you must experience feelings when you are working in a cognitive job, like programming or air traffic control [6] A spasm of pleasure can arise without any external stimulus, purely by operations within one's own brain. For example, a person who has just woken from sleep may have an insight and experience a spasm of pleasure arising from it. The insight is cognitive, with neural correlates largely in the cortex, whereas the spasm of pleasure, physiologically quite separate, is largely subcortical. As a finite human being you can not avoid the pleasure from simple matching [6] . Otherwise, you may be working against the nature of thinking and you may hurt yourself mentally.

In fact, even the thinking process itself creates emotions without any external inputs and it does so independent from the things you think [7] . Winkielman [8] et al. states affective responses may also result from the dynamics of information processing itself. Fluency with which one can extract information from the presented stimulus is hedenocially marked. High fluency elicits positive affective reaction. ease of processing is consistently associated with more positive evaluations. [9]

Our feelings about our thinking process helps us to complete missing data or speed up our thinking process. the fluency signal may be connected to affect by indicating the state of the ongoing processing operations. Thus, high fluency may indicate progress toward successful recognition and trigger positive affect due to the reinforcing value of maintaininfg the current, successful cognitive strategy and the ability to free resources for other tasks. [9] The link between the metacognitive system and the affect system is further supported by neuroimaging and elektropysiological data [9] . It has been proved that brain's parts related to metacognitive regulation and emotion processes or emotional control are the same [9].

The mechanics of the thinking process is affected by our emotions. Switching from one context to another, the rate of changing subjects, the amount of concentration, the depth of thinking through different abstraction levels, getting obsessed to solve the problem, thinking speed are dramatically affected by the affective situation we are in while thinking The various glands of the endocrine system release hormones into the bloodstream that have effects on specific sites in the brain, including those involved in emotion says Cornelius [5] . A careful observer can notice that there are different working speeds of thinking in our brains. Our brains work in a slow mode when we are doing something related with safety or security(but not related to emergency) where as our ideas fly when we are doing something sentimental or dreaming Thinking speed helps us to switch from one processor to another in our multiprocessor brain. Feelings and selecting the right mood help us to choose the right processor (or combination of processors) to do the 'thinking'.

Let's ask another question from the other side Are feelings only a by-product of the thinking process, cognition? No. If you please read Schachter's definition at the beginning of this article once more, you will notice that 'physiological arousal', trembling, increase in the blood temperature, heart rate etc. are also part of emotions. Also the instincts play a vital role besides the cognition element.
By observing human behaviour we can only notice that there is an intimate relation between emotion and cognition. We can go further by enhancing our sometimes ampirical experiments with today's advanced neurological imaging techniques

* * *

The main problem is to define 'What is cognition?' and 'What is emotion?' inorder to understand the character of the relation between them Freud states ideas are cathexes-basically of memory traces-whilst affects and emotions correspond to processes of discharge, the final manifestations of which are percieved as feelings. [11] He also adds Even within the limits of normal life we can recognize that a constant struggle for primacy over affectivity goes on between the two systems Conscious and Unconscious, that certain spheres of influence are marked of from one another and that intermixtures between the operative forces occur. [11

Hinde asks the common view of emotion as a state has many attendant problems. Is it a motive or a trait? Is it an intervening variable or a hypothetical construct? [12] and argues that emotion is best defined in terms of chains or loops with emotion and cognition closely linked. [12]
Strongman states Emotions has sometimes been analysed as an intervening variable, anchored to observable stimuli and responses.

I believe, any person who has studied data structures and computer architecture, can come to a similar conclusion after reading this article upto this point and maybe reading the references the better Namely, a conclusion on the question of Do computers feel? Let's have a look at the LINUX operating system books

An interrupt [13] is usually defined as an event that alters the sequence of instructions executed by a processor. Such events correspond to electrical signals generated by hardware circuits both inside and outside of the CPU chip. As the name suggests, interrupt signals provide a way to divert the processor

to code outside the normal flow of control. When an interrupt signal arrives, the CPU must stop what it's currently doing and switch to a new activity;□ □Each hardware device controller capable of issuing interrupt requests has an output line designated as an IRQ (Interrupt ReQuest). All existing IRQ lines are connected to the input pins of a hardware circuit called the Interrupt Controller, □
□The Intel 80x86 microprocessors issue roughly 20 different exceptions. The kernel must provide a dedicated exception handler for each exception type. For some exceptions, the CPU control unit also generates a hardware error code and pushes it in the Kernel Mode stack before starting the exception handler.□

If we make an analogy between Dewey's definition of emotion and work on the example of a touch to the keyboard; (1) the □feel□ (the feeling of fear, pride, humility)'s name is keyboard interrupt (2)purposeful behaviour is the interrupt handler program of the LINUX Operating System (3) an object that has an emotional quality is the person who touches, namely the user. Freud states □certain spheres of influence are marked of from one another□ in my above quotation from his article 'Unconscious'. Which is analogous to □As the name suggests, interrupt signals provide a way to divert the processor to code outside the normal flow of control.□ in my quotations from LINUX manuals. Dewey's classifications of emotions have many similarities to interrupts and exceptions which also have different types. Dewey's □Calm and Violent emotions□ vs. soft and hardware interrupts□ It is impossible to tell all the similarities between the interrupt processing subsystem of the computer operating system including the hardware architecture and the human emotion processing.

The basis of the similarity between the human emotional system and the computer interrupt system arises from the very nature of cognition. Cognition can not exist without some sort of interaction with living matter. The ideas in this article can not exist without being written on some sort of interaction media, may be a newspaper the better. By that, the journey of emotions begin, the reader holds the newspaper, maybe smells it, reads it and likes or even loves an article and binds to the newspaper with devotion□

Cornelius [14] outlines the results of recent neurophysiology research in his book □The Science of Emotion□ in 10 pages. His book could outline the rest of all the past studies in 210 pages□
So if you want to have the answer of our question with his style in terms of physiology: □Both the hippocampus and amygdala are complexly interconnected with inputs from both the sensory organs and the viscera. They also serve as the origin of projections that connect them with Autonomic Nerve System as well as higher cortical areas. They, and perhaps other structures of the lymbic system, appear to integrate sensory information with information from the various organs of the viscera as well as feedback from the ANS to control the □output□ of emotional expression in the ANS and other parts of the nervous system (LeDoux, 1986 Neurobiology of Emotion).□

The nature of interaction requires the existence of a mechanism which processes □the inputs from both the sensory organs. [14]□ When you touch the keyboard or click the mouse, press the Esc button, put a CD in the driver etc. the hardware connections, Interrupt Request Lines carry this □sensory signal□ instinctively work and trigger the interrupt controller, analogous to the amygdala□
The interrupt controller trigs the operating system very similar to the senses trigging emotions. The normal cognitive processing comes to a halt and the operating system runs the related interrupt service

routine, which has a label analogous to Weyle's □feel□□ When the interrupt service routine does the task, for example writing to the disk, then returns back information about its success□
By the way, when the computer writes to the disk some trembling and noise indicate a similar situation to human □arousal□□

Aesop had told once upon a time a fable about the fox and the grapes; the fox tries to reach the grapes on the wine, but it can not. He says □They are sour anyway.□ Sartre suggests □In short, in emotion it is the body which, directed by consciousness, changes its relations with the world in order that the world may change its qualities. [15] □ Isn't it the same with computers? When the computer meets a situation that it can not healthily handle, for example a division by 0, it issues an exception of Divide error and diverts the program execution to the related interrupt handler rather than abruptly stopping□

Our initial question was □Do computers feel?□ My answer is no because they can not express their feelings with the same □feels□ as humans, such as joy, love, anger, fear, happiness, guilt, sadness, embarressment, hope usw. On the other hand, computers do have an embedded interrupt and exception system in both soft and harware which is analogous to the human limbic system□

Then if my answer is no, why did I write this article with such an ambition? Because, □Do computers feel?□ is a wrong question□ The right question should be □Why don't computers have emotions like us?□ It is us who have created computers together with the knowledge and wisdom passed to us from the distant past□ We are the human-being who spend many man-years to create the operating systems but think very little on the effects of it on its users.

Large and complex systems, air traffic control systems and similar jobs demand long duration high concentration working from today's engineers and system operators. Not to mention, the new growing engineers, toddlers who spend many hours on their computer games everyday□ Have you noticed every soldier killed on the computer game, has to die convincingly, thus takes some time so that the kid's concentration relaxes a bit in the mean time□

On the Christmas of 2008, I wish □Computers could feel□ so that their users do not lose their feelings working with high concentration for long hours□

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[1] Strongman, The Psychology of Emotion, p. 1.
[2] Calhoun, Solomon, What is an Emotion, p.152, Dewey, The Theory of Emotion.
[3] Calhoun, Solomon, What is an Emotion, p.97, Hume, A Treatise of Human Nature.
[4] Calhoun, Solomon, What is an Emotion, p.174, Schachter and Singer, Cognitive, Social, and Physiological Determinans of Emotional State.
[5] Cornelius, 'The Science of Emotion', p. 23.
[6] Brian Bayly, The Brain's Internal Reward from Matching, p. 1.

[7] Pronin, Wegner, Manic Thinking, Independent Effects of Thought Speed and Thought Content on Mood.
[8] Winkielman et al., The Hedonic Marking of Processing Fluency: Implications for Evaluative Judgment, p. 191.
[9] Winkielman et al., Affect and Processing Dynamics, Emotional Cognition, from Brain to Behaviour, p. 120.
[10] Cornelius, 'The Science of Emotion', p. 224.
[11] Calhoun, Solomon, What is an Emotion, p. 192, Freud, The Unconscious.
[12] Strongman, The Psychology of Emotion, p. 3.
[13] Daniel P. Bovet, Marco Cesati, Understanding the Linux Kernel, Interrupts and Exceptions, p. 96.
[14] Cornelius, 'The Science of Emotion', p. 226.
[15] Calhoun, Solomon, What is an Emotion, p.247, Sartre, The Emotions: A Sketch of a Theory.

<title>Relaxing After High Concentration - 3</title>

A FUNCTION OF IMAGENING

We adjust our concentration level by looking and seeing. They normally balance each other through the natural flow of the events in the daily life. This balance determines the thinking speed. Motivation, dreaming about success or dreaming about things that will come with success increases our bodyly and mental capacity hence helps us to succeed.

Let's return back to the vision metaphor. If we focus on something and look at it sternly, our looking focus gets smaller, concentration increases to maximum, on the other hand ambient vision begins to increase and after a while our vision gets blurred and our eyes begin to contemplate. There is a natural control mechanism that stops the increase in the concentration. Focused vision based on conscious control is balanced by ambient vision which is controlled by subconscious in the daily life.

Unfortunately, when doing things professionally or using long duration high concentration we stop this natural mechanism with our control mechanism and determination. As a result of this, we are left with a mental tiredness at the end of the job that we can not get rid of with the natural mechanisms of our mind. To relax from high concentration we should erase the memory areas that were used, or forget everything related to this task. This is not a simple operation. The experience that is gathered, the knowledge that is attained must be organized and stored but at the same time the unnecessary information details, semantic relations that are gathered shall be erased or in the computing jargon 'garbage collection' must be done. Hence,mental activity does not end at the end of the task. The Project Evaluation meeting is important not only for the preservation of the organization experience but also it serves the mental health of the individuals who participated in the project.

One of the things that the garbage collection in the human mind is done with, is imagening. In the evaluation meetings that I have mentioned above, alternative suggestions on how to do things and, what would have happened, would enable us to see other possibilities and opportunities besides the routine pieces of the task.

I will write an other article on the organization aspect of the subject. The working memory that we use for cognition is not similar to a computer memory. It is not organized as linear located cells on a page. It is fragmented and distributed with many interconnections. Indeed the working memory is a collection of neurons distributed in the brain that can be kept connected and reached during a certain time frame. Even the input buffers and the long term buffers may be included to the working memory as needed. This happens when long duration high concentration is used and is frequent in software development.

In order to relax, the relational connections shall be erased. The connections can not be erased with a single commend like a computer. Accept in the case of electric schock... Something has to be overwritten in order to be forgotten. Infact, this is impossible.If the information has stayed under the attention for a considerable duration, it will be connected to a very wide network. This is an automatic connection process which may reach very high abstraction levels. Nevertheless if something is not updated proportionate to its tenure under attention, it will finally get forgotten or, its retrieval become extremely difficult. Of course this is related with the subject matter, personal things related to te very self are difficult to forget.

McKIM proposes this solution in the Directed Imagination section of his book 'Experience in Visual Thinking': Control the passive negative worries and transform them to a productive imagination. If you worry about a failure, dream the positive success instead. If you are afraid of missing a deadline, dream the happiness you will fell when you catch it... McCim also mentions that one should use professional advise when utilizing imagination.

I believe added to the methods related to decreasing the thinking speed, imagining or day-dreaming may also help. Imagining small dreams related to the job done that day, may be completely absurd, unrelated, funny dreams, freeing your mind, imagination, subconscious from everything may help to forget the already created load of semantically related connections.

In his work named 'Imagination and Emotion' Sartre states that the necessity for a consciousness to imagine is the ability to propose an unreal hypothesis. In short, in order to imagine, you should propose a hypothesis Outside the existing phenomenons and against the reality theyconvey. If pondered upon, one can see that this is close to being impossible if tried to achieve completely. Sartre proposes that this can be done at least using a certain point of view. Sartre states In order to imagine, conciousness should be able to escape from the world; should be able to withdraw from the world with its own effort. For this, Conciousness must be free.

Sartre's 'Imagination and Emotion' includes strong clues that after long duration high concentration, imagening may do the 'garbage collection' that I have described above. I will further elaborate in my future articles on this matter.

Man becomes great to the extent that he controls his imagination. (Rolf Alexander, The Mind in Healing, Dutton).
Ali R+ SARAL

<title>Notes from AN INTEGRATIVE THEORY OF PREFRONTAL CORTEX FUNCTION</title>

My notes from: AN INTEGRATIVE THEORY OF PREFRONTAL CORTEX FUNCTION (41 pages)

Earl K. Miller, Center for Learning and Memory, RIKEN-MIT Neuroscience Research Center and Department of Brain and Cognitive Sciences, MIT.
Jonathan D. Cohen, Center for the Study of Brain, Mind, and Behavior and Department of Psychology, Princeton

Abstract ... cognitive control stems from the active maintenance of patterns of activity in the prefrontal cortex that represent goals and the means to achieve them. They provide bias signals to other brain structures whose net effect is to guide the flow of activity along neural pathways that establish the proper mappings between inputs, internal states, and outputs needed to perform a given task.

INTRODUCTION ...
Simple behaviors can rely on relatively straightforward interactions between the brain's input and output systems. Animals with fewer than a hundred thousand neurons (in the human brain there are 100 billion or more neurons) can approach food and avoid predators. For animals with larger brains, behavior is more flexible. ...
...
To deal with this multitude of possibilities and to curtail confusion, we have evolved mechanisms that coordinate lower-level sensory and motor processes along a common theme, an internal goal.
...
It is well positioned to coordinate a wide range of neural processes: The PFC is a collection of interconnected neocortical areas that sends and receives projections from virtually all cortical sensory systems, motor systems, and many subcortical structures. ...

The Role of the PFC in Top-Down Control of Behavior
The PFC is not critical for performing simple, automatic behaviors, such as our tendency to automatically orient to an unexpected sound or movement. These behaviors can be innate or they can develop gradually with experience as learning mechanisms potentiate existing pathways or form new ones. These hardwired pathways are advantageous because they allow highly familiar behaviors to be executed quickly and automatically (i.e. without demanding attention). However,these behaviors are inflexible, stereotyped reactions elicited by just the right stimulus. They do not generalize well to novel situations, and they take extensive time and experience to develop. These sorts of automatic behaviors can be thought of as relying primarily on bottom-up processing; that is, they are determined largely by the nature of the sensory stimuli and well-established neural pathways that connect these with corresponding responses.

By contrast, thePFC is important when top-down processing is needed; that is, when behavior must be guided by internal states or intentions. The PFC is critical in situations when the mappings between sensory inputs, thoughts, and actions either are weakly established relative to other existing ones or are rapidly changing. This is when we need to use the rules of the game, internal representations of goals

and the means to achieve them. Several investigators have argued that this is a cardinal function of the PFC...

...

This illustrates one of the most fundamental aspects of cognitive control and goal-directed behavior: the ability to select a weaker, task-relevant response (or source of information) in the face of competition from an otherwise stronger, but task-irrelevant one. Patients with frontal impairment have difficulty with this task... ...

Overview of the Theory

We assume that the PFC serves a specific function in cognitive control: the active maintenance of patterns of activity that represent goals and the means to achieve them. They provide bias signals throughout much of the rest of the brain, affecting not only visual processes but also other sensory modalities, as well as systems responsible for response execution, memory retrieval, emotional evaluation, etc.

The aggregate effect of these bias signals is to guide the flow of neural activity along pathways that establish the proper mappings between inputs, internal states, and outputs needed to perform a given task. This is especially important whenever stimuli are ambiguous (i.e. they activate more than one input representation), or when multiple responses are possible and the task-appropriate response must compete with stronger alternatives. From this perspective, the constellation of PFC biases...can be viewed as the neural implementation of attentional templates, rules, or goals, depending on the target of their biasing influence.

...

When a behavior meets with success, reinforcement signals augment the corresponding pattern of activity by strengthening connections between the PFC neurons activated by that behavior. This process also strengthens connections between these neurons and those whose activity represents the situation in which the behavior was useful, establishing an association between these circumstances and the PFC pattern that supports the correct behavior.

...

But we believe that this general notion can explain many of the posited functions of the PFC. The biasing influence of PFC feedback signals on sensory systems may mediate its role in directing attention (Stuss &

Benson 1986; Knight 1984, 1997; Banich et al 2000), signals to the motor system may be responsible for response selection and inhibitory control (Fuster 1980, Diamond 1988), and signals to intermediate systems may support short-term (or working) memory (Goldman-Rakic 1987) and guide retrieval from long-term memory (Schachter 1997, Janowsky et al 1989, Gershberg & Shimamura 1995).

Without the PFC, the most frequently used (and thus best established) neural pathways would predominate or, where these don't exist, behavior would be haphazard. Such impulsive, inappropriate, or disorganized behavior is a hallmark of PFC dysfunction in humans (e.g. Bianchi 1922, Duncan 1986, Luria 1969, Lhermitte 1983, Shallice & Burgess 1996, Stuss & Benson 1986).

Minimal Requirements for a Mechanism of Top-Down Control

There are several critical features of our theory. First, the PFC must provide a source of activity that can exert the required pattern of biasing signals to other structures. We can thus think of PFC function as □active memory in the service of control.□ It follows, therefore, that the PFC must maintain its activity robustly against distractions until a goal is achieved, yet also be flexible enough to update its

representations when needed. It must also house the appropriate representations, those that can select the neural pathways needed for the task. In sofar as primates are capable of tasks that involve diverse combinations of stimuli, internal states, and responses, representations in the PFC must have access to and be able to influence a similarly wide range of information in other brain regions. That is, PFC representations must have a high capacity for multimodality and integration. Finally, as we can acquire new goals and means, the PFC must also exhibit a high degree of plasticity. Of course, it must be possible to exhibit all these properties without the need to invoke some other mechanism of control to explain them, lest our theory be subject to perennial concerns of a hidden homunculus.
...
pattern of deficits following PFC damage as a loss of the ability to acquire and use behavior-guiding rules. ...
...
A GUIDED ACTIVATION THEORY OF PFC FUNCTION ...
A Simple Model of PFC Function ...
Guided Activation as a Mechanism of Cognitive Control
...the role of the PFC is modulatory rather than transmissive. That is, the pathway from input to output does not run through the PFC. Instead, the PFC guides activity flow along task-relevant pathways in more posterior and/or subcortical areas.
...
This distinction between modulation vs transmission is consistent with the classic pattern of neuropsychological deficits associated with frontal lobe damage. The components of a complex behavior are usually left intact, but the subject is not able to coordinate them in a task-appropriate way (for example, a patient who, when preparing coffee, first stirred and then added cream). ...

Active Maintenance in the Service of Control...
another critical feature of our theory: the importance of sustained activity as a mechanism of control...
...
executive control involves the active maintenance of a particular type of information: the goals and rules of a task.
...
selective attention and behavioral inhibition are two sides of the same coin: Attention is the effect of biasing competition in favor of task-relevant information, and inhibition is the consequence that this has for the irrelevant information.
...
In particular, we believe that PFC-mediated control is complemented by another form of control dependent on the hippocampal system. The hippocampus is important for binding together information into a memory of a specific episode (Eichenbaum et al 1999, McClelland et al 1995, Squire 1992, Zola-Morgan & Squire 1993). By contrast, we suggest that the PFC, like other neocortical areas, is more important for extracting the regularities across episodesin the case of the PFC, those corresponding to goals and task rules, rather than episodic memories of actually performing the task. We further posit that the PFC uses activity-based control; that is, its ongoing activity specifies the pattern of neural pathways that are currently needed. If PFC activity changes, so does the selected pattern of pathways.

By contrast, the hippocampus may provide a form of □weighted-based□ control; it helps consolidate permanent associative links between the pieces of information that define a long-term memory (Cohen & O'Reilly 1996, O'Reilly et al 1999, O'Reilly 2000). To use the railroad metaphor, the hippocampus is responsible for laying down new tracks and the PFC is responsible for flexibly switching between them. As noted below, interactions between the PFC and the hippocampus may provide a basis for understanding prospective forms of control, such as planning.

Updating of PFC Representations
In the real world, cognitive control is highly dynamic...is highly flexible. So long as suitable representations exist within the PFC, activating them can quickly invoke a goal or rule, which can be flexibly switched to others as circumstances demand. That is, it is easier and faster (and perhaps less costly) to switch between existing tracks than it is to lay new ones down.
...
PFC representations are selectively responsive (adaptive) to task-relevant stimuli (Rainer et al 1998b), yet they are resistant to interference (robust) from distractors (Miller et al 1996). Conversely, two hallmarks of damage to the PFC are perseveration (inadequate updating) and increased distractibility (inappropriate updating)
...
Recent modeling work suggests that hierarchical updating and the sequencing of actions may rely on interactions between the PFC and the basal ganglia.

<title>A FEW CORRECTIONS and SOME COMMENTS</title>

A FEW CORRECTIONS and SOME COMMENTS
ON EUROCONTROL's Safety Regulation Requirement
ESARR 6 - Software in ATM Systems

CORRECTIONS

I - Mandatory Provisions, 1. General safety Requirements, item 1.2
a) The software requirements correctly state what is required by the software, in order to meet safety objectives and requirements, as identified by the risk assessment and mitigation process;

should rather be

a) The software requirements correctly state what is required from the software,

II - Requirements applying to the software safety assurance system, item 2.4,
b) the assurances corresponding to each software assurance level shall give sufficient confidence that the ATM software can be operated tolerably safely.

The term tolerably safe is not explained in the document, safety is defined as □freedom from unacceptable risk□,

Should rather be
 can be operated with acceptable risk
or
 can be operated with safety. (the flexibility in the definition itself suffices)

III - Item 2.6,
 developmental and non-developmental are unnecessary new words which do not contribute to the jargon more than the overhead they create.

IV. Requirements applying to the software assurance level, item 3.2

 the architectural and/or procedural defences identified

defences should be precautions or precaution systems if you like. (would be nice if it were football;-)

IV - Appendix A

Accuracy: The required precision of the computed results.

Accuracy and precision and the relation between them should be clearly defined. Some university books define precision as the repeatibility of results regardless of their accuracy. Accuracy is only the correctness of a measurement nothing else

V - Resource usage: The amount of resources within the computer system that can be used by the application software.

Should be

by a specific application in the software

VI - The definition for the word 'risk' is a little bit cumbersome but perfact in meaning

VII - Safety: Freedom from unacceptable risk

implies that freedom includes acceptable risk which is quiet clever And after this, safety is referred to in'acceptable or tolerable safety', which means 'acceptable or tolerable acceptable risk situation' according to the definition of 'safety.'

acceptable or tolerable safety

Should be either

Safety

Or
Acceptable or tolerable risk (situation)

VIII - The term 'Software Timing Performances' may have been used to bring in meaning flexibility for future developments and it is also out of any jargon that I have heard of The definition given points at exactly the term 'response time'. It does not sound 'just' to do things like this unless they are done unintentionally.

COMMENTS

I - This is a difficult document to write. Many who are involved with ATC rather closely would choose not to write it at all

II -The document has to set a framework so that assigned authorities, service providers etc. should be gently leaded to a more formal way of doing things and maybe doing them better as a natural result. The document is good in this respect.

III - On the other hand, the document misses conscientious aspect of software development and maintenance in ATC in the thick cloud of gentle politics, interest balancing etc. Bluntly, there is nothing in the document which ensures the identification of who has done which software change or development item. ESARRs have conscientiously protected anonymity of engineers who may have caused involuntary harm to the air traffic. ESARR 6 falls short of adressing the individual responsibility in retrograde of this.

should be

6.4 A person who has done an error in the ATM software should be easily identifiable through the use of Configuration management.

IV - Testing should have been mentioned explicitly

VII - Software inspection by peers and group leaders should have been mentioned explicitly

The last two items are no less important or relevant than traceability in software requirements.

APPENDIX

TURKISH TRANSLATION OF ESARR 6
WORK IN PROGRESS
By Ali R+ SARAL

EUROCONTROL
Hava Seyrüseferi Güvenliği için Avrupa Kuruluşu

(EUROCONTROL-European Organisation for the Safety of Air Navigation)

EUROCONTROL Güvenlik Düzenleyici Şartnamesi
(ESARR-EUROCONTROL Safety Regulatory Requirement)

ESARR 6

Hava Trafik Yönetim Sistemlerindeki Yazılımlar
(Software in ATM Systems)

F.2 BELGE ÖZELLİKLERİ

ESARR6 yazılım güvenliği güvence sistemlerinin hayata geçirilmesi ile ilgilenir. Bu sistemler güvenlik ile ilgili yer yüzüne-konumlandırılmış ATM sistemlerindeki yazılımların kullanımlarına ilişkin risklerin hoş görülebilecek bir seviyeye indirilmesini güvenceye alır.

ESARR6 yazılım için herhangi bir destekleyici uyum yöntemi öngörmez. Bunu yapmak yazılım güvencesi standartlarının payına düşer. Dolayısıyla, özgün milli ve uluslararası yazılım güvencesi standartlarını harekete geçirmek bu şartnamenin sınırları dışındadır.

Bu şartnamenin amacı ATM güvenlik düzenleyici kuruluşları ve ATM hizmet sunucularına ATM sistemlerinde yazılım kullanımı için bütünsel ve uyumlu bir grup güvenlik düzenleme şartı sağlamaktır.

F.6 YÖNETİMSEL ÖZET

Bu EUROCONTROL Güvenlik Düzenleyici Şartnamesi(ESARR) Güvenlik Düenleyici Komisyon tarafından hazırlanmıştır.

ESARR6 yeryüzüne-konumlandırılmış ATM güvenlik sistemlerindeki yazılımların kullanım risklerinin hoş görülebilecek bir seviyeye indirilmesinden emin olmak için yazılım güvencesi sistemlerinin hayata geçirilmesi ile ilgilenir.

Bu yüzden, bu ESARR'ın amacı ATM sistemlerinde yazılım kullanımı için bir grup uyumlu güvenlik düzenleyici şartı sağlamaktır. Hiçbir yazılım güvencesi standardını kendi zorunlu koşullarını karşılamak için kabul edilebilir bir uyum yöntemi olarak belirlemez. Buna bağlı olarak, özgün milli ve uluslararası yazılım güvencesi standartlarını harekete geçirmek bu şartnamenin sınırları dışındadır.

Bu ESARR'ın koşulları EUROCONTROL Daimi Komisyonu tarafından onaylanmasından 3 yıl sonra uygulamaya girecektir.

TANITICI MALZEME

Bu kısımdaki koşullar zorunlu değildir.

A. KAPSAM

i. ESARR 6, sivil hava trafiğine ATM hizmetleri sağlamak için kullanılan, güvenlik ile ilgili, yeryüzüne konumlandırılmış ATM(hava trafik yönetimi) sistemlerinde yazılım kullanımıyla (cutover / hot swapping gibi tüm işletimsel yazılım değiştirme işlemleri dahil) ilişkilidir.

ii. ESARR 6'nın kapsamı ATM hizmet-sağlayıcının idari kontrolü altındaki yeryüzüne konumlandırılmış CNS gibi destek hizmetleri dahil, ATM'in yeryüzü bileşeni ile sınırlıdır. Değiştirilmediği ve uygun bir şekilde yeniden gözden geçirilmediği takdirde ESARR6 gökte ya da uzayda uçan ATM sistemi bileşenleri için uygulanamaz.

iii. Bu güvenlik düzenleyici şartnamenin koşulları, yazılım tarafından icra edilen ATM işlevleri dahil ATM'in tüm sahalarının gereğince değerlendirilmesinden emin olmak için, a priori, önkoşul olarak, etkin risk değerlendirme ve uygun bir seviyeye risk azaltması çalışması yapılması temelinde geliştirilmiştir.

iv. ESARR 6 yazılım için herhangi bir destekleyici uyum yöntemi öngörmez. Bunu yapmak yazılım güvencesi standartlarının payına düşer. Buna bağlı olarak, özgün milli ve uluslararası yazılım güvencesi standartlarını harekete geçirmek bu şartnamenin sınırları dışındadır.

B. GEREKÇE

i. SRC'nin 6/8/5 kararı SRC İş Programı içinde yazılım temelli ATM sistemleri için bir EUROCONTROL Güvenlik Düzenleyici Şartnamesi geliştirilmesini içermeyi onayladı. Aynı zamanda, ICAO standartları ve tavsiye edilen ICAO uygulamalarında ilk örnek teşkil edecek hiçbir şey olmadığı olgusu da kabul edildi.

ii. ESARR 3(Güvenlik Yönetim Sistemlerinin ATM hizmet sağlayıcıları tarafından kullanımı) ATM sistemine yapılan değişikliklerin önemlerine göre değerlendirilmesini ve ATM sistem işlevlerinin ciddiyetlerine göre sınıflandırılmasını güvenceye almak için güvenlik yönetim sistemlerinin Risk Değerlendirme ve Azaltma içermelerini şart koşar.

iii. ESARR 4 (Hava Trafik Yönetiminde Risk Değerlendirme ve Azaltma - Risk Assessment and Mitigation in ATM) Risk Değerlendirme ve Azaltma üzerinde ESARR3'ün şartlarını genişletir ve Hava Trafik Yönetimi sistemini insanlar, işlemler ve cihazlar (yazılım ve donanım) açısından ve onların ATM sisteminde değişiklik yapmaları / tasarlamaları açısından ele almak için her yönden kapsayıcı bir işlemler dizisi sağlar.

iv. ESARR 6 bu güvenlik düzenleyici geliştirme sürecinin devamıdır ce ATM sistemlerinin yazılım yanına ilişkin olarak ESARR 4'ü genişletir. Donanım yanı için tamamlayıcı güvenlik düzenleyici şartname değerlendirme altındadır.

v. Güvenlik ATM sistemlerinin temel bir özelliğidir. İşletimsel etkinlik üzerinde ağırlıklı bir çarpıcı etkiye sahiptir. Yığınsal ve sistemli yazılım kullanımı, daha önce elle icra edilen işletimsel işlevlerin otomasyonu ve sürekli büyüyen tümleşik ortamlarda önemli etkileşimler içeren ATM sistemleri güvenlik elde edilmesinde daha resmi-formal yaklaşımlar talep etmektedir.

vi. Bu ESARR'ın amacı ATM sistemlerinin kullanımı için ATM güvenlik kuruluşları ve ATM hizmet sunucularına bütünsel ve uyumlu bir grup güvenlik düzenleyici şart sağlamaktır.

C. GÜVENLİK HEDEFİ

Yazılım içeren ATM sistemlerinin sağlaması gereken birincil yazılım güvenlik amacı ATM yazılımı kullanımı ile ilişkilendirilmiş risklerin hoş görülebilir bir seviyeye indirilmesinden emin olunmasıdır.

ZORUNLU KOŞULLAR

1. GENEL GÜVENLİK ŞARTLARI

1.1 Güvenlik Yönetim Sistemi yapısı içinde ve risk değerlendirme - azaltma faaliyetlerinin bir parçası olarak, ATM hizmet-sağlayıcısı sorunun yazılım ile ilgili yanlarını ele almak için (cutover/hot swapping gibi bütün kullanım sırasındaki işletimsel yazılım değişiklikleri dahil) bir Yazılım Güvencesi Sistemini uygulamaya koymalıdır.

1.2 ATM hizmet-sağlayıcı, Yazılım Güvenlik Güvencesi Sisteminde, en azından, şunlardan emin olmalıdır;

a) Yazılım şartnamesi, risk değerlendirme - azaltma sürecinde belirlendiği şekilde, güvenlik amaçlarını ve şartlarını sağlamak için yazılımın(?) yapması gereken şeyleri doğrulukla belirtir.
b) İzsürülebilirlik-traceability bütün yazılım şartları açısından ele alınmış;
c) Yazılım gerçekleştirliş şekli güvenliği olumsuz etkileyecek hiçbir işlev içermez;
d) ATM kendi yazılım şartnamesini yazılımın hayatiyeti ile tutarlı bir güvenlik seviyesi yüksekliğinde sağlar;
e) Yukarıdaki Genel Güvenlik Şartnamesi'nin sağlandığına ilişkin güvencelerin ve gereken güvencelerin sağlandığına ilişkin tartışmaların her zaman aşağıdakilere dayandırılması;

i. yazılımın belirli bir icra edilebilir sürümü
ii. bir dizi yapısal-kurulum-configuration verisi
iii. belirli bir grup yazılım ürünü ve o sürümün üretilişinde kullanılmış tanımlar(tarifnameler dahil).

1.3 ATM hizmet-sağlayıcısı Atanmış Otoriteye, yukarıda bölüm 1.2'deki şartların sağlandığına ilişkin gerekli güvenceleri sağlamalıdır.

2. YAZILIM GÜVENLİK GÜVENCESİ SİSTEMİNE UYGULANAN ŞARTLAR

ATM hizmet-sağlayıcı, Yazılım Güvenlik Güvencesi Sisteminin en azından şunları sağladığından emin olmalıdır;

2.1 Belgelenmiş olmalı, özellikle genel Risk Değerlenirme - Azaltma Belgeleme Sisteminin parçası olarak.

2.2 Bütün işletimsel ATM yazılım yazılım güvence seviyeleri ataması.

2.3 Aşağıdakilerin güvencelerine sahiptir;

a) Yazılım şartları geçerliliği-software requirements validity
b) yazılım doğrulama-software verification
c) yazılım yapısal-kurulum yönetimi-software configuration management
d) yazılım şartnamesi izsürülebilirliği - software requirements traceability

2.4 Güvencelerin hangi azim ve ısrar ile gerçekleştirildiğini belirler. Azim ve ısrar her yazılım güvencesi seviyesi için tanımlanmalı ve yazılımın hayatiyeti ile doğru orantılı artmalıdır. Bu amaçla;

a) Her yazılım güvencesi seviyesi başına güvence azim ve ısrarındaki değişim aşağıdaki kriterleri içermelidir:

i. bağımsız olarak başarılması gerekir
ii. başarılması gerekir
iii. şart değil.

b) Her yazılım güvence seviyesine denk düşen güvenceler ATM yazılımının hoş görülebilir(?) şekilde güvenli işletilebileceğine yeterli güven vermelidir.

2.5 Yazılı Güvenlik Güvencesi Sisteminin ve güvence seviyelerinin atamasının uygun olduğunun doğrulanması için ATM yazılım tecrübesinden geri dönerek faydalanır. Bu amaçla, ESARR 2'ye göre raporlanmış ATM işletimsel tecrübesinden herhangi bir hata veya yazılım arızası sonucu etkiler ESARR 4 yapısı bağlamında değerlendirilmelidir.

2.6 Atanmış Otorite tarafından seçilmiş ve kabul edilmiş herhangi bir yöntem ile, eşit yazılım güvencesi seviyelerindeki, geliştirilmiş ya da hazır alınmış ATM yazılımı için(COTS vb.), eşit güvenlik seviyesi sağlar.

3. YAZILIM GÜVENCESİ SEVİYESİNE UYGULANAN ŞARTLAR

ATM servis-sağlayıcısı Yazılım Güvenliği Güvence Sistemi içinde, en azından şunlardan emin olmalıdır:

3.1 Yazılım güvencesi seviyesi, yazılım güvencelerinin azim ve ısrarını ATM yazılımının hayatiyetine, ESARR 4 ciddiyet sınıflama şeması ile belirli bir olumsuz etkinin oluşması olasılığını birleştirerek, ilişkilendirir. 1. yazılım güvencesi seviyesi en hayati seviyeyi belirtmek üzere, en az 4 yazılım güvencesi seviyesi tanımlanmalıdır.

3.2 Ayrılmış bir yazılım güvencesi seviyesi ESARR 4'e göre yazılım arızaları ve hatalarının neden olabileceği en olumsuz etki ile denk düşmelidir. Bu, yazılım arızaları ve hataları ile ilişkili riskleri ve belirlenmiş yapısal ve/veya işlem-dizisel-procedural savunmaları(?-tedbirleri demek istiyor-ARS) hesaba katmalıdır.

3.3 Birbirlerinden bağımsız oldukları gösterilemeyen ATM yazılım unsurları bağımlı unsurlar arasındaki en hayati yazılım güvencesi seviyesine ayrılmalıdır.

4. YAZILIM ŞARTNAMESİ GEÇERLİLİK GÜVENCELERİNE UYGULANAN ŞARTLAR

ATM servis-sağlayıcısı Yazılım Güvenliği Güvence Sistemi içinde, en azından yazılım şartlarının:

4.1 ATM yazılımının (normal ve geriseviyelendirilmiş-downgraded çalışma türlerinde) işlevsel davranışını, icra hız(?) seviyeleri, kapasite, doğruluk, hedef bilgisayarda yazılımın kaynak kullanımı, anormal işletimsel durumlarda ayakta kalma yeteneği - robustness
ve aşırı yüklenmeye dayanıklılık, uygun şekilde belirlemesi.

4.2 Tam ve doğru olmaları ve sistem güvenlik şartnamesi koşullarına uymaları gerekir.

5. YAZILIM DOĞRULAMA GÜVENCELERİNE UYGULANAN ŞARTLAR

ATM servis-sağlayıcısı Yazılım Güvenliği Güvence Sistemi içinde, en azından şunlardan emin olmalıdır:

5.1 ATM yazılımının işlevsel davranışının, icra hız(?) seviyeleri, kapasite, doğruluk, hedef bilgisayarda yazılımın kaynak kullanımı, anormal işletimsel durumlarda ayakta kalma yeteneği - robustness ve aşırı yüklenmeye dayanıklılığının yazılım şartnamesi koşullarını sağlar.

5.2 ATM yazılımı, Atanmış Otorite ile mutabakata varıldığı gibi, analiz ve/veya deneme ve/veya eşdeğer yöntemlerle uygun bir şekilde doğrulanır.

5.3 ATM yazılımının doğrulanması doğru ve tamdır.

6. YAZILIM KURULUM-YAPISI(configuration) YÖNETİMİ GÜVENCELERİNE UYGULANAN ŞARTLAR

ATM servis-sağlayıcısı Yazılım Güvenliği Güvence Sistemi içinde, en azından şunlardan emin olmalıdır:

6.1 Yapısal-kurulum-configuration belirlemesi, iz-sürülebilirlik ve durum takibi-status accounting vardır öyle ki, ATM yazılım yaşam-döngüsü-lifecycle boyunca yazılım yaşam-döngüsü verilerinin yapısal-kurulum kontrolü altında olduğu gösterilebilir.

6.2 Sorun raporlama, takip ve düzeltici eylemler vardır öyle ki yazılıma ilişkin güvenlik ile ilgili sorunların azaltıldığı gösterilebilir.

6.3 Öyle yeniden ele alma ve hizmete sunma eylem dizileri-procedure vardır ki ATM yazılım yaşam-döngüsü sırasında yazılım yaşam-döngüsü verileri yeniden canlandırılabilir ve teslim edilebilir.

7. YAZILIM ŞARTNAMESİ İZSÜRÜLEBİLİRLİK GÜVENCELERİNE UYGULANAN ŞARTLAR

ATM servis-sağlayıcısı Yazılım Güvenliği Güvence Sistemi içinde, en azından şunlardan emin olmalıdır:

7.1 Sağlandığı gösterilmiş olan her tasarım seviyesine her bir yazılım şartının izi-sürülebilir.

7.2 Tasarımdaki her seviyede, sağlandığı gösterilmiş olan her bir yazılım şartının bir sistem şartına kadar izi-sürülebilir.

8. UYGULANABİLİRLİK

8.1 Bu güvenlik şartnamesi idari kontrolleri altındaki, yeryüzüne-konuşlandırılmış ATM sistemleri ve destek hizmetleri (CNS gibi)'nden sorumlu olan sivil ve askeri ATM hizmet sağlayıcıları için geçerlidir.

8.2 Askeri ATM kuruluşunun doğrudan idari kontrolü altındaki ATM sistemlerinin zaten var olan yazılım güvencesi sistemi, ESARR 6'nın zorunlu koşulları ile denk düşmek şartı ile geçerli kabul edilebilir.

8.3 Bu ESARR'ın zorunlu koşulları milli güvenlik düzenleyici şartnamelerin asgari koşulu olacaktır.

9. GERÇEKLEŞTİRME

9.1 ESARR 6'nın koşulları EUROCOMTROL komisyonu tarafından onaylandığı tarihten itibaren 3 yıl içinde etkin olacaktır.

APPENDIX

<title>Focus vs. Concentrate</title>

'To focus' and 'to concentrate' are two different forms of 'attention[3]'.

Attention contains an element of interest and a determination to deal with a certain thing. Focus is a point at which rays (as of light, heat, or sound) converge or from which they diverge[4]. More abstractly focus is a center of activity, attraction, or attention[4]. All three of these terms have their roots in absolute usages. They have gained more abstract meanings through the time.

More precisely, attention is a condition of readiness for applying the mind to something[1]. To focus is to bring into attentional focus[1], to cause to be concentrated[1]. To concentrate is to bring or direct toward a common center or objective[2], to focus one's powers, efforts, or attention[2]. Please refer to the references for extensive dictionary entries.

In one of the forms of visual attention attention is concentrated to a specific area of the visual scene (i.e. it is focused), The focus is an area that extracts information from the visual scene with a high-resolution, the geometric center of which being where visual attention is directed [5].

To focus is by definition to exclude something and direct the attention to the focused area. This is the same for visual or abstract focusing. To focus on an object means to gather our attention to that specific object and exclude others.

To concentrate is more abstract than to focus by definition. In terms of looking with your eyes, , concentrating means to look at something and see other things only in relation to this reference point. To focus means to look at something and not see other things at all.

Concentric means 'having a common centre[6]'. It also means 'to make dense[2]'. To concentrate on an abstract thing means to focus in the beginning on only that thing but than begin to look for all the things semantically related to this focused thing and progress in spheres of abstraction outwards and far from the beginning point.

Focusing implies unconditional exclusion by definition. Concentrating implies inclusion of every possible related thing to a limited subject. For every concentration effort probably there is a focusing stage at the beginning.

Focusing and concentrating are mental functions that belong to human mind. The character of these functions give strong clues on their origins in the mind.

selective attention and behavioral inhibition are two sides of the same coin: Attention is the effect of biasing competition in favor of task-relevant information, and inhibition is the consequence that this has for the irrelevant information[7]. Selective attention is a Pre Frontal Cortex (PFC) function.
PFC provides many executive control functions including the sense of consciousness.

It is more difficult to find specific limited similarities for concentrating. Concentrating implies strong memory access (probably long term and short term), Anterior Cingulate Cortex for checking whether the semantically related item is really related and usefull, PFC fro executive control and keeping the matter under the control of the 'will' and probably others.

A carefull comment can be made after these. Concentrating needs more flexibility and relaxing than focusing. You need brute force to focus immediately, but a more relaxed and flexible attitude and possibly more interaction[8] while concentrating.

Memory retrieval is faster when done as an automatic process. Automatic processes need a more relaxed and flexible attitude. Increased interaction also may help to create interruptions which ACC needs to intervene to check the correctness of the current process[9].

Ali R+ SARAL

REFERENCES:

[1] Merriam-Webster

Definition of FOCUS

transitive verb
1a : to bring into focus b : to adjust the focus of (as the eye or a lens)

2: to cause to be concentrated

Selective Attention
In cognitive psychology there are at least two models which describe how visual attention operates. These models may be considered loosely as metaphors which are used to describe internal processes and to generate hypotheses that are falsifiable. Generally speaking, visual attention is thought to operate as a two-stage process.[11] In the first stage, attention is distributed uniformly over the external visual scene and processing of information is performed in parallel. In the second stage, attention is concentrated to a specific area of the visual scene (i.e. it is focused), and processing is performed in a serial fashion.
The first of these models to appear in the literature is the spotlight model. The term "spotlight" was inspired by the work of William James who described attention as having a focus, a margin, and a fringe.[12] The focus is an area that extracts information from the visual scene with a high-resolution, the geometric center of which being where visual attention is directed. Surrounding the focus is the fringe of attention which extracts information in a much more crude fashion (i.e. low-resolution). This fringe extends out to a specified area and this cut-off is called the margin.

[6] Merriam-Webster

Definition of CONCENTRIC
1: having a common center
[9] AN INTEGRATIVE THEORY OF PREFRONTAL CORTEX FUNCTION

Earl K. Miller, Center for Learning and Memory, RIKEN-MIT Neuroscience Research Center and Department of Brain and Cognitive Sciences, MIT.

Jonathan D. Cohen, Center for the Study of Brain, Mind, and Behavior and Department of Psychology, Princeton

There was no differential activation observed within ACC during this period. In contrast, strong activation was observed in ACC during the period of stimulus presentation and responding. This activity was greater for conflict than congruent stimuli.

<title>Attention Mistakes of the Pre-reflective Consciousness</title>

Pre-reflective consciousness is 'Gözlemci Bilinç' or exactly 'ön-yansıtıcı bilinç' in Turkish. Reflective consciousness is 'yansıtıcı bilinç'.

Reflective consciousness is the consciousness that we use when we talk, think etc. As in saying 'I have the command'. We are aware of not only doing something but also that it is we(I) that is doing it.

The pre-reflective consciousness deals with only the perception of the task, the necessary response giving and doing the job. As if it is somebody else acting The reason behind the term pre-reflective is İn this type of consciousness although a sense of self is missing the task is actually done by that person. The person feels its existance by performing that task but naming or identifying that being is not the condition. 'Pre-reflective' consciousness is a reflection of consciousness from the environment that interacts. This indirect reflection of consciousness from the environment is not 'reflective' as in the case of consciousness adrressing itself.

Please note the reference below which you can find from the Library of Congress.

Effortless attention : a new perspective in the cognitive science of attention and action / edited by Brian Bruya. Cambridge, Mass. : The MIT Press, c2010.

There are other types of consciousnesses or levels of consciousness. Non-conscious or automatic etc. Sub-conscious processes are a type of non-conscious processes. I will ponder on the how and where to use of these in the future.

In an accident close to the Rhein-Karldap control region in the year 1992 the pilot had entered the height level wrong. There have been many developments and research in many areas since then. In the spot light of these my question is: What may be the reason for attention mistakes during the use of pre-reflective consciousness? What can be done to stop these?

An ATCO has to do many things in a difficult situation, so he uses divided attention. His concentration increases too. This leads to an increase in his thinking speed. The increase in his thinking speed pushes his mind from reflective consciousness to pre-reflective consciousness. The operational conversations moves towards the standard jargon also.

Now the question is, why do mistakes or mishaps, slips happen during the use of pre-reflective consciousness?

1-Overload. Some external reasons make cause attention mistakes.

2-Internal reasons. Affective or self related problems may cause the pre-reflective consciousness fail. When you say or think 'I' or feel a feeling or the worst of it if you feel need for something the pre-reflective consciousness weakens.

3-Motivation. I will ponder on this later. Will and intention are keys in the control of the type of consciousness. A general malaise in volition may cause serious problems in the level of pre-consciousness. I have caused once an interrupt of service to the airplanes in the air during my service at Karlsruhe-Germany ATC area control center and severe lack of motivation was one of the reasons.

Some interesting references:

Unconscious Behavioral Guidance Systems, John A. Bargh,Department of Psychology, Yale University

Ezequiel Morsella, Department of Psychology, San Francisco State University; Department of Neurology, University of California, San Francisco - 2009

Oxford handbook of human action / edited by Ezequiel Morsella, John A. Bargh,Peter M. Gollwitzer. - 2009

Towards a Computational Model of Perception and Action in Human Computer Interaction
Pascal Haazebroek and Bernhard Hommel, Cognitive Psychology Unit & Leiden Institute for Brain and Cognition,Wassenaarseweg 52, Leiden, 2333 AK The Netherlands - 2009

<title>understanding the interaction between cognition and emotion</title>

Short Notes from:
Cognitive and emotional influences in anterior cingulate cortex
George Bush, Phan Luu and Michael I. Posner

Anterior cingulate cortex (ACC) is a part of the brain's limbic system. Classically, this region has been related to affect, on the basis of lesion studies in humans and in animals.
...
ACC might be the brain's error detection and correction device.
...
ACC is a part of a circuit involved in a form of attention that serves to regulate both cognitive and emotional processing. Neuroimaging studies showing that separate areas of ACC are involved in cognition and emotion.
...
(1) Cingulate cortex includes specific processing modules for sensory, motor, cognitive and emotional information.
(2) As a whole, cingulate cortex integrates input from various sources (including motivation, evaluation of error, and representations from cognitive and emotional networks).
(3) Cingulate cortex acts by influencing activity in other brain regions and modulating cognitive, motor, endocrine and visceral responses.
...

cingulate cortex encompasses numerous specialized subdivisions that subserve a vast array of cognitive, emotional, motor, nociceptive and visuospatial functions.
...
Its two major subdivisions subserve distinct functions. These include a dorsal cognitive division (ACcd; areas 24b9-c9 and 329) and a rostral-ventral affective division (ACad; rostral areas 24a-c and 32, and ventral areas 25 and 33).
...
The cognitive subdivision is part of a distributed attentional network. It maintains strong reciprocal interconnections with lateral prefrontal cortex (BA 46/9), parietal cortex (BA 7), and premotor and supplementary motor areas6. Various functions have been ascribed to the ACcd, including modulation

of attention or executive functions by influencing sensory or response selection (or both); monitoring competition, complex motor control, motivation, novelty, error detection and working memory; and anticipation of cognitively demanding tasks (see Refs 1,3,5,6,14-17 for reviews).

The affective subdivision, by contrast, is connected to the amygdala, periaqueductal gray, nucleus accumbens, hypothalamus, anterior insula, hippocampus and orbitofrontal cortex6, and has outflow to autonomic, visceromotor and endocrine systems. The ACad is primarily involved in assessing the salience of emotional and motivational information and the regulation of emotional responses5,6,15,18.
...
The cognitive division (ACcd) has been activated (Fig. 2a) by cognitively demanding tasks that involve stimulus- response selection in the face of competing streams of information, including Color Stroop and Stroop-like tasks, divided- attention tasks, verbal- and motor-response selection tasks and many working-memory tasks. The affective division (ACad) has been activated (Fig. 2a) by affect-related tasks, including studies of emotional processing in normal healthy volunteers and symptom provocation studies in a number of psychiatric disorders (anxiety, simple phobia and obsessive-compulsive disorder). It has also been activated repeatedly by induced sadness in normal subjects
and in individuals with major depression.
...
Combining functional imaging, anatomical and behavioral methods will be important for understanding the interaction between cognition and emotion.
...
These studies suggest that both dorsal ACC and areas of the lateral prefrontal cortex operate together during tasks that involve high levels of mental effort.
...
According to this hypothesis, the cognitive division of the ACC serves to monitor crosstalk or conflict between brain areas, and this computation signals the need for control processes. Lateral areas of the cortex are then activated to provide control operations, which might include increasing or inhibiting neural activity within distinct brain areas so as to eliminate the confusion between modules.

<title>A Mathematical Model of Abstraction</title>

Soyutlamanın Matematiksel Bir Modeli
A Mathematical Model of Abstraction

Soyutlamalar = { [a1 .. ai] a is a name and i □ (1□ N+) }
Abstractions = { [a1 .. ai] a bir isim ve i □ (1□ N+) }

ai = { name, [item1 .. itemj] name is the name of ith abstraction, item is the name of any object, j □ (1□ N+)}
ai = { isim, [şey1 .. şeyj] isim i. Soyutlamanın ismi, şey herhangi bir nesnenin ismi, j □ (1□ N+)}

Abstraction is realized by selecting a unifying attribute of a certain group of objects. The later use of this abstraction is done through looking up the existing abstractions list. As a first step the existing

abstractions list is defined for this reason. Large systems require the frequent use of many terms, abbreviations, and acronyms. Each item of these is a list of abstractions of the problem domain.

Soyutlama belirli bir grup nesnenin ortak özellikleri seçilip buna bir isim vererek gerçekleşir. Bu soyutlamanın daha sonraki kullanımları ise 'Soyutlamalar' adlı varolanlar listesine bakarak gerçekleşir. Bu nedenle ilk olarak bir var olan soyutlamalar listesi tanımlanmıştır. Büyük sistemler çok sayıda kısaltma ve teknik deyim kullanımını gerektirir. Bunlara ilişkin sözlüklerin herbiri aslında birer varolan 'soyutlamalar' listesidir.

İkinci formulde görüldüğü gibi soyutlamak gruplamaktır. Soyutlama herhangi bir nesneler grubundan oluşabilir.Bu nesneler soyut nesneler de olabilir. Yani bir soyutlama diğer soyutlamaların gruplaması olabilir. Örneğin uçaklar Jet uçakları, pervaneli uçaklar diye iki soyutlamadan oluşur. Bu iki grupta yolcu ve özel uçaklardan Ama hepsi kanatlıdır ve motorludur. Eğer bu açıdan bakarsak uçaklar tek bir soyut gruptur. Eğer yolcu sayısı ve
kullanım açısından bakarsak uçaklar farklı alt gruplardan oluşur.

The flexibility of abstraction gives us the ability to approach different problems from different point of views.
Soyutlamadaki esneklik farklı sorunlara çeşitli açılardan yaklaşma imkanını verir.

Soyutlamanın Nesne Yönelimli Tanımı
An Object Oriented Definition of Abstraction

```
public abstract class AbstAbstraction {
```

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   <title>On the Interaction of Automatic Processes with Consciousness</title>
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It
is not possible, or even desirable, to remain in focal attention one hundred percent of the time. Many activities, like driving a car, for example, require constantly shifting attention for the sake of safety. An individual's concentration and focus will naturally be interrupted by automatic attention throughout the day, not just because it is necessary to notice what is happening in the surrounding environment, but also to give the brain a rest.

I believe, large systems operators such as ATCOs, ATC
engineers are faced with the risk of continuously concentrating for long durations which puts them at the risk of losing the natural balance of their

minds, the balance between automatic processing and controlled - conscious processing.

Some relevant material is given below to facilitate the interested readers.

, 'Controlled and automatic human information processing: I. Detection, search, and attention', 1977,

A 2-process theory of human information processing is proposed and applied to detection, search, and attention phenomena. Automatic processing is activation of a learned sequence of elements in long-term memory that is initiated by appropriate inputs and then proceeds automatically-without S control, without stressing the capacity limitations of the system, and without necessarily demanding attention. Controlled processing is a temporary activation of a sequence of elements that can be set up quickly and easily but requires attention, is capacity-limited (usually serial in nature), and is controlled by the S.

Michael I. Posner Department of Psychology, University of Oregon, Eugene, OR, USA and Sackler Institute for Human Brain Development,

Consciousness has many aspects. These include awareness of the world, feelings of control over one's behaviour and mental state (volition), and the notion of a continuing self. Focal (executive) attention is used to control details of our awareness and is thus closely related to volition. Experiments suggest an integrated network of neural areas involved in executive attention. This network is associated with our voluntary ability to select among competing items, to correct error and to regulate our emotions

Definition of Consciousness - Merriam - Webster
the quality or state of being aware especially of something within oneself
the state or fact of being
concern for some social or political cause

the state of being characterized by sensation, emotion, volition,
and thought

the upper level of mental life of which the person is aware as
contrasted with unconscious processes

From Wikipedia, the free
encyclopedia
psychoanalytic
theory make
themselves unaware. The psychoanalytic unconscious is similar to but not
precisely the same as the popular notion of the For psychoanalysis, the unconscious does not
include all of what is simply not conscious - it does not include e.g. motor
skills - but rather, only what is actively from conscious
thought. In the psychoanalytic view, the unconscious is a force that can only be
recognized by its effects - it expresses itself in the symptom.

Lacking
awareness and the capacity for sensory perception; not conscious.

Temporarily
lacking consciousness.

Occurring
in the absence of conscious awareness or thought: unconscious resentment;
unconscious fears.

Without
conscious control; involuntary or unintended:

The Philosophy Of Freedom - A.
Unconscious Functioning

Concepts of the
unconscious
We cannot be conscious of everything
we do and how we do it. For example, tying our shoelaces, walking, speaking,
and driving are all guided to a large degree by unconscious processing, which
broad domain is also denoted by terms such as automaticity or implicit
memory. The reason we have extensive unconscious capabilities has to do

with efficiency. The very complex informational environments that the brain is required to handle are beyond the capacity of consciousness, which can contain only one or a few things at a time

Definitions of unconsciousness

unconscious means contents or processes that we cannot report being aware of, with automatic referring to processes and subliminal to external stimuli. Included here are contents and processes we cannot in principle become aware of (often termed nonconsciuos), such as how the visual system builds perceptions, as well as those we can become aware of, such as a stressful situation we have momentarily forgotten.

[Implicit Memory - Wikipedia

in which previous experiences aid in the performance of a task without conscious awareness of these previous experiences. Evidence for implicit memory arises in , a process whereby subjects are measured by how they have improved their performance on tasks for which they have been subconsciously prepared. Implicit memory also leads to the illusion-of-truth effect, which suggests that subjects are more likely to rate as true those statements that they have already heard, regardless of their veracity. In daily life, people rely on implicit memory every day in the form of , the type of memory that allows people to remember how to tie their shoes or ride a bicycle without consciously thinking about these activities.

is the selection of some incoming information for further processing. Attention may be differentiated according to its status as "overt" versus "covert." Overt attention is the act of directing organs towards a stimulus source. Covert attention is the act of mentally focusing on one of several possible sensory stimuli. Covert attention is thought to be a neural process that enhances the signal from a particular part of the sensory panorama.

Voluntary vs. Automatic Attention

Attention can

be directed either voluntarily, also referred to as endogenous control, or automatically, which is also called exogenous or reflexive attention. While endogenous control involves one choosing of their own volition to direct their attention, exogenous control occurs when an external object or event, for example, a bee flying by, grabs attention away from the book one is reading, and attracts it involuntarily.

Paying attention behind the wheel: a framework for studying the roleof attention in driving Department of Psychology, University of Guelph, Guelph, Ontario, Canada, University of British Columbia, Vancouver, British Columbia, Canada, Insurance Corporation of British Columbia, Vancouver, British Columbia, Canada)

Automatic vs. controlled processes. Automatic processes involve selection without awareness. These processes are effortless, fast, and can be carried out concurrently with other processes without compromising performance. Once automatic processes are initiated, they are difficult to modify. Also, automatic processes typically do not produce changes in declarative long-term memory. Consequently, a person may drive home from work on 'auto-pilot' and have no conscious memory of the trip.

In contrast, controlled processes involve selection with awareness. These are conscious processes, but they are also laborious and slow, and it is difficult to carry out several controlled processes at once. Controlled processes can be started, stopped, or modified at will, and can produce conscious changes in long term memory through learning. With practice, some controlled processes may even become automatic.

Exogenous vs. endogenous processes. Exogenous selection occurs as a result of the way humans are built and it is initiated by the presence of specific stimulus configurations. In this case, external stimuli seem to trigger selection (it is exogenous), but the reason these stimuli produce this effect is because of the way the nervous system is built. Specifically, the nervous system is structured to respond to certain stimuli preferentially, so that there is a continuum of stimulus salience, with some types of stimuli more likely to receive exogenous selection than others.
In general, when a person is in an unfamiliar environment, and thus has no specific expectations, exogenous processing is dominant. Similarly, if a

person has no specific goals in a familiar environment, exogenous processing dominates. Exogenous processing is easily confused with bottom-up or stimulus-driven processing, but it is not the same thing. When we refer to exogenous selection we mean something that is 'hard wired'. In contrast, bottom-up or stimulus-driven processing may also occur as a result of extended practice or learning, which are the result of internal (or endogenous) factors. For example, when a person repeatedly carries out a deliberate intention, after a while the response becomes so over-learned that it occurs automatically, and it may seem that the stimulus alone is 'driving' the behavior. Selection has been triggered by the stimulus (bottom-up) independent of any intentional goals (top-down). Nonetheless, this would not constitute exogenous selection in our sense because selection was not 'hard wired'; the association resulted from repeated conscious intentions to carry out a goal (Theeuwes 1991). Some processes are bottom-up but not exogenous.

Endogenous selection results from what people know about an environment and what they want to achieve. People actively search the environment for information relevant to specific goals or intentions; they perform these tasks in ways that are consistent with expectations and previous learning. Expectancies may act as a form of 'perceptual set' causing people to look for specific objects at certain locations. A perceptual set can be advantageous because it directs viewers to the goal-relevant information in a scene, and thus facilitates accomplishment of goals. An example would be looking for the exit ramp sign on a familiar freeway. Endogenous selection helps drivers react more rapidly, as occurs when they anticipate the need to brake (Johansson and Rumar 1971, Van der Hulst . 1999). While endogenous selection can facilitate performance, it can also produce errors when drivers miss pertinent information because it is unexpected or does not pertain to current goals (Hills 1980, Rumar 1990).

. Four modes of attentional performance

By combining automatic and controlled processing with exogenous and endogenous selection, it is possible to derive four modes of performance relevant to the study of attention and driving. The first, automatic-exogenous, can be thought of as the collection of all reflexes that are initiated by stimuli. The second, automatic-endogenous, corresponds to processing that is habitual. The third, controlled-exogenous, corresponds to a mode of performance that occurs when a person's only goal is exploration. The fourth, controlled-endogenous, corresponds to deliberate goaldriven behavior.

These two types of process are reflexive

(automatic-exogenous) and habitual (automaticendogenous). There are a number of important differences between reflex
and habit. First, though both are triggered by particular stimuli, these triggers are established in different ways. Reflexes are innately 'hard wired' into the system, whereas habits are automatic because a particular goal or intention has been repeatedly carried out. As a result, reflexes are common to all whereas habits are idiosyncratic, based on a given individual's specific learning experiences. Second, reflexes emerge on a developmental timetable and are stable once acquired, whereas habits can be formed at any time, and can also be replaced or fade at any time due to lack of practice or new learning.

Some processes are more automatic than others in the sense
that they are initiated more quickly, require less effort, are more likely to be evoked unintentionally in a given situation, and are thus more difficult to bring under deliberate control. In such a continuum, reflexes retain their position near the extreme end on the automaticity continuum, whereas habits change their level of automaticity based on the frequency with which they are practiced ...

, Jason
M. Chein,'Controlled & automatic processing: behavior, theory, and biological mechanisms', Cognitive Science 27 (2003) 525-559 (Department of Psychology, University of Pittsburgh, 3939 O'Hara St., Pittsburgh, PA 15221, USA)

This paper provides an overview of
developments in a dual processing theory of automatic and controlled processing that began with the empirical and theoretical work described by Schneider and Shiffrin (1977) and Shiffrin and Schneider (1977) over a quarter century ago. A review of relevant empirical findings suggests that there is a set of core behavioral phenomena reflecting differences between controlled and automatic processing that must be addressed by a successful theory. These phenomena relate to: consistency in training, serial versus parallel processing, level of effort, robustness to stressors, degree of control, effects on long-term memory, and priority encoding.

2. Definition of automatic and
controlled processing
The basic nature of automatic and controlled
processing was laid out in our earlier papers. In Schneider and Shiffrin (1977), an was defined as the activation of a
sequence of nodes that nearly always becomes active in response to a

particular input configuration,□ and that □is activated automatically without the necessity for active control or attention by the subject□ (p. 2).

In general, automatic processes □operate through a relatively permanent set of associative connections and require an appreciable amount of consistent training to develop fully□ (Schneider&Shiffrin, 1977, p. 2). An is a special type of automatic process that directs attention automatically to a target stimulus (Schneider & Shiffrin, 1977).

In contrast to automatic processes, Schneider and Shiffrin (1977, pp. 2-3) defined a as □a temporary sequence of nodes activated under control of, and through attention by, the subject.□ Furthermore, controlled processes are □tightly capacity limited, but the costs of this capacity limitation are balanced by the benefits deriving from the ease with which such processes may be set up, altered, and applied in novel situations for which automatic sequences have never been learned.□

Josh McDermott, 'Workspace Theory: Consciousness Explained?' - The Harvard Brain Harvard university undergraduate Journal of Neuroscience.

Baars proposes that consciousness is the result of a Global Workspace in the brain that distributes information to the huge number of parallel unconscious processors that form the rest of the brain

many unconscious processes underlie ordinary perception and cognition. (By an unconscious process, I mean a process that takes place in the brain of which we are unaware

Baars treats the brain as a large group of separable, very specialized systems that are unconscious much of the time that they operate. At least some of these processes can, one by one, become conscious, and the successive outputs of these processes constitute conscious experience. Significant, though, is the idea that only one process can be conscious at one instant of time. In other words, consciousness is a serial phenomenon.

Baars' second claim about consciousness is that it has internal consistency, a property not shared by the collection of unconscious processes in the brain.

Baars cites as an example of this property the experience of viewing a Necker cube, an optical illusion which we can consciously see in one of two different orientations. The two views of the cube can "flip" back and forth, but we cannot entertain both of them simultaneously

that a huge variety of things can be experienced consciously, but that by definition, an unconscious specialized processor can perform but a limited range of tasks

Another property of consciousness is its ability to relate what seem to be any two conscious experiences to each other. The best example of this is classical conditioning, where virtually any conscious stimulus may serve as a signal for virtually any other event. This relating cannot occur if the experiences are unconscious. Baars cites a study showing that Pavlovian association cannot occur if the signal stimulus has been repeated to the point of habituation (when the stimulus ceases to be consciously experienced). (Razran, 1961)

A fifth contrast is that conscious experiences are what Baars terms "context-sensitive," while representations processed unconsciously are not. Context-sensitivity is defined by Baars as "the way in which conscious events are shaped by unconscious factors." (Baars, 1988, p 79) Our conscious experiences are constantly affected by unconscious assumptions. Unconscious events are, in contrast, not influenced by such contextual assumptions ...

Finally, there are the contrasts of inefficient, error-prone conscious processes with efficient, relatively error-free unconscious processes. These can be illustrated with any task that a person learns. While unlearned, a task has to be performed consciously, at which point it is done slowly and with frequent errors. Once learned , the task is unconscious, and is performed with comparative speed and accuracy.

There is limited evidence that there is a delay involved in some types of conscious events, and that much unconscious preprocessing goes on prior to the conscious experience of something (Libet, 1978). Thus it is conceivable that error detection has nothing at all to do with consciousness.

Focal attention refers to a type of attention in which the individual is deliberately, consciously focused on a certain thing to the exclusion of surrounding images or noises. Automatic

attention occurs when an individual's attention is drawn by something; for instance, a loud noise might cause someone to look up or lose focus, and is in many cases a response that cannot be controlled. Focal attention is intense deliberate concentration, and is a skill that can be practiced

It is not possible, or even
desirable, to remain in focal attention one hundred percent of the time. Many activities, like driving a car, for example, require constantly shifting attention for the sake of safety. An individual's concentration and focus will naturally be interrupted by automatic attention throughout the day, not just because it is necessary to notice what is happening in the surrounding environment, but also to give the brain a rest.

[13] Kiefer,
Markus; Executive control over unconscious cognition:
attentional sensitization of unconscious information processing,
Published online 2012 March 23. doi: PMCID:
PMC3311241

[14]
Jennifer McBride1*,
Frédéric Boy2, Masud Husain1 and Petroc Sumner2 Automatic motor activation in the executive control of
action 1 Institute of Cognitive Neuroscience
and Institute of Neurology, University College London, London, UK 2 School of Psychology,
Cardiff University, Cardiff, UK

<title>FALSE SENSE OF SAFETY</title>

What is real, what is false?
How do we decide what we percieve through our sensesis an illusion or not?
How do we feel confidence in the information we get and the meaning we assign to it?

"If the rate of directional change is quite small - and not confirmedby the eyes - the change will be virtually undetectable and the pilotprobably will not sense any motion whatsoever".

In a large Air Traffic Control(ATC) system, a time span of continiousmaintenance activity with many successfull changes may cause the formation of a false sense of safety.

How can an operational manager decide what he percieves in a general sense is real or not?

Any changes he decides to be made to the large system causes an increase in the risk to the safety. On the other hand any necessary changes he decides to delay may cause an increasein the risk for the future safety.

How can he decide the risk he percieves at that moment is a real reasonable one?

Actually, we all face this dilemma in many facets of our lives... What is real, what is false? How do our brains decide what is real?

Some of our brain's mysterious algorithms are:

- Repetition or repeatibility: If stg is real, it has to be there when tested more than once.
-Episodic memory: It has to be remembered as a part of a sequence of events...
-Rightness anticipation: It has to be coherent with our knowledge and long term memory.
-Perceptibility: It has to be percived by our senses.

When carefully inspected all four of these ingredients carry thediscrepancies which form the false sense of safety in a large system.

The formation of the sense of reality in the human mind is reflectedto the air traffic control systems architecture(including the human element).

False sense of safety is the vertigo of Air Traffic Control system.

Ali Riza SARAL
Note:
Second article will be on "Situation Awareness in the Maintenance and Enhancement of ATC systems".Third article will be on the "Passenger's Right to Know"...

<title>Quotations from "The Prefrontal Cortex: Minireview"</title>

My quotations from: The Prefrontal Cortex: Minireview
Complex Neural Properties for Complex Behavior
Earl K. Miller*
Department of Brain and Cognitive Sciences and The Center for Learning and Memory
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139
...
The PF cortex is a collection of cortical areas in the most anterior portion of the frontal lobes (Figure 1). It has long been associated with high-level, executive processes needed for voluntary goal-directed behavior. Its damage in humans does not produce a single, characteristic deficit. Rather, it results in disturbances in a variety of functions, including attention, memory, response selection, planning, and inhibitory control.

Studies of the neural basis of PF function in monkeys focused primarily on active short-term, or working memory. They have revealed that when a delay is imposed between a visual stimulus and a response based on it, many PF neurons show sustained stimulus-related activity (Goldman-Rakic, 1994; Fuster, 1995). Because sensory inputs are often fleeting, this short-term maintenance may be fundamental to many cognitive functions. However, complex behavior requires more than temporary storage. Relevant sensory inputs need to be selected and integrated with other information common to the goal at hand. Also needed are the executive mechanisms that determine, for example, which stimuli are relevant and should be selected. Much less is known about the neural basis of these higher functions.
...
In many views of cognition, the type of executive control thought to be mediated by the PF cortex is synonymous with attentional selection, that is, the ability to voluntarily focus awareness on certain sensory inputs, thoughts, or actions. Selection is necessary because higher-order cognitive functions are severely limited in capacity. Indeed, at a given moment we are aware of only a small fraction of available sensory information.

Given these capacity limitations, the ability to ignore distractions and select behaviorally relevant information is critical. Evidence that the lateral PF cortex is involved in selection processes comes from a number of studies, including a recent study by Rainer et al. (1998b)
...
Earlier target selection in the PF cortex suggests that the visual cortex may inherit target information from the PF cortex. That is, that the PF cortex may be a source of the top-down signals that mediate attentional selection in the visual cortex (Desimone and Duncan.)

Complex behavior, however, depends on more than selecting sensory information. To benefit from past experience, we must be able to select (recall) stored knowledge. Watanabe (1996) demonstrated this ability in PF neurons. He found that when monkeys could predict that a specific reward would appear (e.g., raisins, cabbage, etc.), the activity of many PF neurons reflected that expected reward. This ability to prospectively code predicted events is thus critical for choosing among response alternatives.

Integration
Sensory processing is highly fragmented. Even within a modality, different stimulus attributes may be separately processed. The primate cortical visual system, for example, is thought to analyze the form and color information to identify a stimulus (i.e., what it is) largely from information about stimulus location (i.e., where it is). An area involved in complex behavior, however, needs to have access to diverse information.

Even actions almost invariably require satisfying multiple, diverse constraints. When I search for my coffee cup, for example, I have in mind not only what it looks like but also where it is likely to be. So, somewhere and somehow, diverse information such as what and where needs to come together. Given its role in organizing behavior and its extensive connections, the PF cortex seems a likely region where integration might be evident, particularly when integration is needed for behavior.
...
Other studies have also found that many PF neurons process both object identity and location.

...
Interconnections between different PF regions (Figure 1) could result in a population of PF neurons with multimodal properties.

Associative Learning, Rules, Context, and Cognitive Control

The complexity of primate behavior is partially attributable to the fact that primates can acquire new goals and manners of achieving them. Not surprisingly, the PF cortex is thought to be central to this ability. Its executive role in brain function has been hypothesized to result from the acquisition and representation of □rules□ that guide goal-directed behavior.

Rule learning depends on forming arbitrary associations between disparate, but behaviorally related, information. We learn that □red□ means □stop,□ for example. The PF cortex seems well positioned to play a role in associative learning. It is interconnected with all sensory systems, with the motor system, and with limbic structures involved in long-term memory and affect; it is truly □association cortex.□
...
Thus, PF activity can reflect stimuli, associated actions, and expected consequences.
...
Cohen and colleagues have suggested how the ability of PF neurons to reflect conjunctions of behaviorally related information might result in mechanisms for executive control. They posit that control emanates from representation of context (Cohen and Servan-Schreiber, 1992). Context is the constellation of task-relevant information needed to guide a given behavior.
...
Top-down signals from the PF cortex are excitatory and represent the to-be-attended item. These signals increase activity of neurons that process the relevant information and, by virtue of the mutual inhibition, suppress activity of neurons processing irrelevant information. Context representations may act in a similar fashion. However, rather than convey only visual attributes, context representations are thought to be multimodal and include information about stimuli, actions, etc., that have become associated through experience. Thus, they can bias motor as well as sensory processing and also allow appropriate actions to be selected and executed.

Conclusions

Recent studies have shown that, consistent with their putative role in the highest level of cognitive function, PF neurons have complex response properties that are highly dependent on, and shaped by, task demands. They selectively process and integrate information needed for a common behavioral goal. Thus, its extensive connections and the ability of its neurons to be modified by experience may allow the PF cortex to play a role in knitting together behaviorally relevant associations, a process needed for acquisition of □rules□ that guide goal-directed behavior. This may result in a representation of context, a template of a previously successful configuration of sensory and response-related information that biases processing in other brain regions in favor of task-relevant information. Such complicated and malleable activity would be expected for a region so closely linked with the complexity and flexibility that are the hallmarks of primate behavior.

<title>Volition at James's Principles of Psychology</title>

Will is a Relation Between the Mind and its 'Ideas' (James, W).

This is a one page quick reference to 'volition' at James's book The Principles of Psychology, 1890. James's approach to the matter of the subject at the section 'Will' is dispalyed with allusions. A three pages relatively extensive reference that I have extracted follows for the interested.

The term 'mind'[1] is the name used to express the functional abilities of our organ 'brain'[2]. Mind's functional abilities can be grouped as 'cognition[3]', 'affection[4]', 'conation[5] (volition[6])'.

Cognition deals with logical mathematical and other sorts of knowledge processing including the gathering, storing and handling of it. Affection is about emotions and how we percieve them as feelings.

Volition is the scientific word used for 'will'. Volition is the power of choosing. The word 'volition' has much more implications than its daily counterpart 'will'. Besides its functional meaning in the mind volition may be mapped to certain parts of the human brain such as PFC-Pre Frontal Cortex and Anterior Cingulate.

Every action is preceded by a stimulus or an idea. Feelings may change to a desire to do something and hence form a stimulus. 'but if we believe that the end is in our power' namely we have a chance to achieve our goal, 'we will that the desired feeling, having, or doing shall be real;' we execute our will and reach our aim as a result.

When the will is not healthy: '. The action may follow the stimulus or idea too rapidly, leaving no time for the arousal of restraining associates - we then have a precipitate will . Or, although the associates may come, the ratio which the impulsive and inhibitive forces normally bear to each other may be distorted, and we then have a will which is perverse'. ... Briefly, we may call them respectively the obstructed and the explosive will .

The Explosive Will.
'There is a normal type of character, for example, in which impulses seem to discharge so promptly into movements that inhibitions get no time to arise.'

'Exhaustion of nervous energy always lessens the inhibitory power.'
''Irritability' is one manifestation of this. Many persons have so small a stock of reserve brain-power - that most valuable of all brain-qualities - that it is soon used up, and you see at once that they lose their power of self-control very soon.'
...
The Obstructed Will.
'In striking contrast with the cases in which inhibition is insufficient or impulsion in excess are those in which impulsion is insufficient or inhibition of in excess.'

Will is a Relation Between the Mind and its 'Ideas.'
'... consider the conditions which make ideas prevail in the mind.'

With the prevalence, once there as a fact, of the motive idea the psychology of volition properly stops.'

'... The willing terminates with the prevalence of the idea; and whether the act then follows or not is a matter quite immaterial, so far as the willing itself goes. I will to write, and the act follows.'

'We have now brought things to a point at which we see that attention with effort is all that any case of volition implies. The essential achievement of the will, in short, when it is most 'voluntary,' is to ATTEND to a difficult object and hold it fast before the mind . The so-doing is the fiat ; and it is a mere physiological incident that when the object is thus attended to, immediate motor consequences should ensue.'

The Feeling of Effort.
'... consciousness ... is in its nature impulsive ...(but-ARS) it must be sufficiently intense... '

Effort of attention is thus the essential phenomenon of will...
' The difficulty is mental; it is that of getting the idea of the wise action to stay before our mind at all. The strong-willed man, however, is the man who hears the still small voice unflinchingly, and who, when the death-bringing consideration comes, looks at its face, consents to its presence, clings to it, affirms it, and holds it fast, in spite of the host of exciting mental images which rise in revolt against it and would expel it from the mind.'

[1] mind n. 1. The human consciousness that originates in the brain and is manifested especially in thought, perception, emotion, will, memory, and imagination(Free Dictionary).

[2] brain n.1. a. The portion of the vertebrate central nervous system that is enclosed within the cranium, continuous with the spinal cord, and composed of gray matter and white matter. It is the primary center for the regulation and control of bodily activities, receiving and interpreting sensory impulses, and transmitting information to the muscles and body organs. It is also the seat of consciousness, thought, memory, and emotion.

[3] cog□ni□tion n. 1. The mental process of knowing, including aspects such as awareness, perception, reasoning, and judgment. 2. That which comes to be known, as through perception, reasoning, or intuition; knowledge.

[4] af□fec□tion n.1. A tender feeling toward another; fondness. See Synonyms at love.
2. Feeling or emotion. Often used in the plural: an unbalanced state of affections. 3. A disposition to feel, do, or say; a propensity.

[5] co□na□tion n. Psychology The aspect of mental processes or behavior directed toward action or change and including impulse, desire, volition, and striving.

[6] vo□li□tion n. 1. The act or an instance of making a conscious choice or decision. 2. A conscious choice or decision. 3. The power or faculty of choosing; the will.

James, W, The Principles of Psychology, 1890

The Principles of Psychology, by William James
Chapter 261
Will.
Desire, wish, will, are states of mind which everyone knows, and which no definition can make plainer. We desire to feel, to have, to do, all sorts of things which at the moment are not felt, had, or done. If with the desire there goes a sense that attainment is not possible, we simply wish ; but if we believe that the end is in our power, we will that the desired feeling, having, or doing shall be real; and real it presently becomes, either immediately upon the willing or after certain preliminaries have been fulfilled.

The Feeling of Effort.
... consciousness ... is in its nature impulsive ...(but-ARS) it must be sufficiently intense . Now there are remarkable differences in the power of different sorts of consciousness to excite movement. The intensity of some feelings is practically apt to be below the discharging point, whilst that of others is apt to be above it. By practically apt, I mean apt under ordinary circumstances.
...
Healthiness of will moreover requires a certain amount of complication in the process which precedes the fiat or the act. Each stimulus or idea, at the same time that it wakens its own impulse, must arouse other ideas (associated and consequential) with their impulses, and action must follow, neither too slowly nor too rapidly, as the resultant of all the forces thus engaged. Even when the decision is very prompt, there is thus a sort of preliminary survey of the field and a vision of which course is best before the fiat comes. And where the will is healthy, the vision must be right (i.e., the motives must be on the whole in a normal or not too unusual ratio to each other), and the action must obey the vision's lead .

Unhealthiness of will may thus come about in many ways . The action may follow the stimulus or idea too rapidly, leaving no time for the arousal of restraining associates - we then have a precipitate will . Or, although the associates may come, the ratio which the impulsive and inhibitive forces normally bear to each other may be distorted, and we then have a will which is perverse . The perversity, in turn, may be due to either of many causes - too much intensity, or too little, here; too much or too little inertia there; or elsewhere too much or too little inhibitory power. If we compare the outward symptoms of perversity together, they fall into two groups , in one of which normal actions are impossible, and in the other abnormal ones are irrepressible. Briefly, we may call them respectively the obstructed and the explosive will .

It must be kept in mind, however, that since the resultant action is always due to the ratio between the obstructive and the explosive forces which are present, we never can tell by the mere outward symptoms to what elementary cause the perversion of a man's will may be due, whether to an increase of one component or a diminution of the other. One may grow explosive as readily by losing the usual brakes as by getting up more of the impulsive steam; and one may find things impossible as well through the enfeeblement of the original desire as through the advent of new lions in the path. As Dr. Clouston says, "the driver may be so weak that he cannot control well-broken horses, or the horses may be so hard-mouthed that no driver can pull them up." In some concrete cases (whether of explosive or

of obstructed will) it is difficult to tell whether the trouble is due to inhibitory or to impulsive change. Generally, however, we can make a plausible guess at the truth.

...

The Explosive Will.

There is a normal type of character, for example, in which impulses seem to discharge so promptly into movements that inhibitions get no time to arise. These are the 'dare-devil' and 'mercurial' temperaments, overflowing with animation, and fizzling with talk, which are so common in the Latin and Celtic races, and with which the cold-blooded and long-headed English character forms so marked a contrast. Monkeys these people seem to us, whilst we seem to them reptilian.

...

But the judicious fellow all the while may have all these possibilities and more besides, ready to break out in the same or even a more violent way, if only the brakes were taken off. It is the absence of scruples, of consequences, of considerations, the extraordinary simplification of each moment's mental outlook, that gives to the explosive individual such motor energy and ease; it need not be the greater intensity of any of his passions, motives, or thoughts.

...

Exhaustion of nervous energy always lessens the inhibitory power.

'Irritability' is one manifestation of this. Many persons have so small a stock of reserve brain-power - that most valuable of all brain-qualities - that it is soon used up, and you see at once that they lose their power of self-control very soon.

...

The Obstructed Will.

In striking contrast with the cases in which inhibition is insufficient or impulsion in excess are those in which impulsion is insufficient or inhibition of in excess.

...

Will is a Relation Between the Mind and its 'Ideas.'

... consider the conditions which make ideas prevail in the mind.

With the prevalence, once there as a fact, of the motive idea the psychology of volition properly stops. ... The willing terminates with the prevalence of the idea; and whether the act then follows or not is a matter quite immaterial, so far as the willing itself goes. I will to write, and the act follows.

We have now brought things to a point at which we see that attention with effort is all that any case of volition implies. The essential achievement of the will, in short, when it is most 'voluntary,' is to ATTEND to a difficult object and hold it fast before the mind . The so-doing is the fiat ; and it is a mere physiological incident that when the object is thus attended to, immediate motor consequences should ensue.

Effort of attention is thus the essential phenomenon of will...

The difficulty is mental; it is that of getting the idea of the wise action to stay before our mind at all. The strong-willed man, however, is the man who hears the still small voice unflinchingly, and who, when the death-bringing consideration comes, looks at its face, consents to its presence, clings to it, affirms it, and holds it fast, in spite of the host of exciting mental images which rise in revolt against it and would expel it from the mind.

The idea to be consented to must be kept from flickering and going out. It must be held steadily before the mind until it fills the mind. Such filling of the mind by an idea, with its congruous associates, is consent to the idea and to the fact which the idea represents.
...
To sum it all up in a word, the terminus of the psychological process in volition, the point to which the will is directly applied, is always an idea . There are at all times some ideas from which we shy away like frightened horses the moment we get a glimpse of their forbidding profile upon the threshold of our thought. The only resistance which our will can possibly experience is the resistance which such an idea offers to being attended to at all . To attend to it is the volitional act, and the only inward volitional act which we ever perform.

<title>Attention Window and the Situation Awareness</title>

Looking is turning our fase and eyes to a certain direction and percieve the objects there as a whole. For example, percieving that the sides of a rectangle connect and the sides are parallel.

In contrast, seeing is identifying this object as 'door'. Looking is a simple operation without mental depth, a process in which lower level seeing information is stored temporarily at the buffer regions.

In seeing the object that is seen gets binded or related with the 'door object' in the semantical memory.

Focusing is the limitation of the area that we see under mental control and inhibition of the area outside.

Concentrating is the increasing of the binding operation during seeing.

For example, the evaluation of the door size, whether it is old or new, a comparison with the other doors etc.

Paying attention includes both focusing and some concentration. We first focuse and limit the area af attention and then concentrate, increase the binding depth somewhat.

The focused thing does not have to be a percievable object. One can focus on an abstract subject. The increasing attention transforms into concentration.

Attention window is the area, details of which contents

are binded with their meanings. We see
the objects that are in the frame at which we focus our attention.

The attention window may be visually three dimensional as
in driving. Attention window is not
visual only. The area which has a high
relational depth forms the attention window when focusing on an abstract
subject.

While solving a problem, attention concentrates on
different aspects of the problem and subjects related to these. The relation's depth and amount
determines
the size of the attention window.

In tasks such as Air Traffic Control, the controller who
may be faced by serious problems, will have to redirect his/her attention
window, shed light upon other subjects, direct his/her attention just after

Experiments have proved that, even some of the things
that reside in the same screen may not be noticed, when the attention window
gets too small.

Situation Awareness requires awareness of the size of the
current attention window.

<title>Due Respect to Istanbul</title>
At the entrance of the Istanbul port,
there is a lighthouse,
in front of Haghia Sophia on the coast.
Lighthouse stands for FENER(lantern) in Turkish.
One of the reasons I like English more sometimes...

The name of this lighthouse is Ahirkapi Feneri
(heavy entrance lantern). Just above this lighthouse,
at the top of the small hill stands Haghia Sophia.
This museum enlightens our minds and shows us
how very large systems can be built to endure.
Previously, it was assigned to be a mosque by
Fatih Sultan Mehmed(Conquerror Sultan).
Before its conquerror, it was meant to be
built as a Church by a Byzantium Emperor.

There is a mysterious water sistern
in the same district left from the Byzantium,

Yerebatan Sarayi(The Sunken Palace).
The Sunken Serail can be visited easily,
walking on pedestrian bridges underground
over the water filled bottom... Its mystery
comes from a collossal head of Medusa dating
from pre-Christian times...

This antique marble head belonged to
a temple that was originally built at the
location of Haghia Sophia or the same vicinity.
The temples were built at the top of hills
to help ship navigation with their burning torches
in those past times. With their wisdom,
they not only guided their society through
violent times but also they managed navigation.
As my former EUROCONTROL colleague had mentioned
once funnyly, the oracle at Didyma, was one of them,
which also gave advises to the king, but the
king was responsible for the results of his decision.
The same principle applies to the pilot and the
Air Traffic controller in the upper airspace.

Returning back to the antique marble head,
turned upside down and used as a base for one of
many columns at the deepest point of the Sunken Palace-
water sistern, I would like to allude:

"just as we forbid sacrifices, so it is Our will that
the ornaments of public works shall be preserved"
The Survival of Roman Antiquities in the Middle Ages,
Michael GREENHALGH 1989 Duckworth, p.93,
Badische Landes Bibliothek.

Said one of the dieties just after the Christian
religion got established. Probably, the Byzantium
Christians liked this but they could not keep it
publicly because it was Pagan.

"From the mid-fourth century it became both
dangerous and unprofitable to be a pagan (survey in
Cochrane 1940, 329 ff.) as 'imparial legislation
offended the Christians a pretext for physical action'
against the cults(Borner, 1984, 346). In the year
365, worshipping images or sacrificing to them

became a capital offence (Cod Th. 16.10.6).

Infact, "pagans gave Christianity 'a good
deal of pagan culture and not a little pagan practice'
(Bonner, 1984, 356).

What strikes me most about ISTANBUL is how
she managed to keep different cultures in herself.
If you have an opportunity to come and visit Istanbul,
please keep an eye on how Istanbul has first hidden
then kept and finally brought her own to the sunlight
again, thus preserved her own culture...

If you sit at Harem and drink a tea at the
Damalis kaffee or at the miniature Virgin tower island,
you enjoy the 360 degrees view of Istanbul... I love
to drink my tea changing locations in the same afternoon,
looking at my city from different locations on the
Bosphorus... Istanbul is a marvelous city built on
seven hills, a water strait and three peninsula...
I grew up in ISTANBUL and with different views
of her.

Istanbul has been a center of ship navigation
and trade for thousands of years. Conquerror Sultan
Mehmed decided to KEEP the city as it is. You will be
able to see with your own eyes, when you visit Haghia Sophia.
He ordered the precious mosaics to be covered with
lime paint. Similar to Byzantians hiding the Medusa head.

Whoever conquers it, Istanbul is a city of TOLERANCE.
She is a country miniaturized in a city... She is a
thousand years time imbued in stone and flesh... She is
millions of soul in a single body. She deserves every bit of
minute interest she drives.

As the European Union is approaching Turkey and
expressing interest to reclaim its own and maybe its
source of aspiration for its next Renaissance,
Istanbul shines as a city of tolerance preserving
what belongs very much to Her.

Istanbul deserves due respect in everything she does.

I wish you a Merry Christmas and happy New Year...

Seasons Greetings to you all...

Ali R+ SARAL

<title>To Look at Spaces</title>

To look at the space is different by its definition from looking at an object. To look at a space is by definition to look at a space inside an area or volume. Because there exists at least the observer.

Our eyes focus when we look at an object. Our attention concentrate on that object.

When we look at a panaroma-general view we use a special technique of looking. We do not look at individual objects but view the general view. In fact this may be the closest way to look at space. Indeed when we view a panaroma we do not look at the elements that form the general view but the abstract volume that they create

What is abstract volume then? Abstarct volume is the entity that is created in multiple dimensions by a set of abstarct entities.

If we reutrn back to the beginning once more Looking at space should trig the opposite of looking functions that are based on focusing (and the other cognitive functions such as attention and concentration). For example, to look at individual trees in a sparsely populated woods vs. looking at the spaces between trees and comparing them etc. may help to difuse concentration and get relaxed. Looking at nothing or not dpecific things may help to relax.

<title>TRIGGERS</title>

Nobody needs to think what to do with a hammer. Hammer's form indicates its function. This is called affordance. Trigger is the same as hammer in this sense. A person who sees a gun understands immediately that he has to pull the trigger to fire. Trigger's affordance is also high similar to hammer.

Imagine all the weapons or devices that begin to work by a single signal. A shotgun, a pistol, a hair dryer, an automobile, a computer and any device that has an open button All of these have a button, switch etc. a mechanism that makes a device work, namely a trigger. Even a baby recognizes that she has to push a button to make something work. They usually make a game out of it though

Trigger is very simple and compact. Its purpose is without any hesitation crystal clear. Its physical appearence, colour and purpose are easily percievable. If the mechanism that the trigger trigs is related to human life, these attributes are even more clear.

From the point of design should the trig mechanism not bear any cognitive function. The action of pulling the trigger should not involve any thinking. The safety mechanism of a gun requires the user to evaluate the situation. After the safety mechanism is released, pulling the trigger and trigging the gun to fire should be extremely easily.

A good trigger should enable its user to react immediately and as required. The Trigger should not have any evaluation, judging or logical ability. Trigger should immediately do what it is required to .

If abstracted, may these attributes of trig be applied to other mechanisms that start systems. For ex., the decision making techniques that we use under emergency conditions, which are very simple and results oriented.
When reacting to a person dying in an emergency room, it is not more important to decide which one is the most appropriate among the 2-3 available options than to apply one of them as quick as possible to give the patient at least some chance of survival It is a 'trigger' that controls the behaviour of the doctor at that moment, a 'trigger' formed previously by his education and experience. It is vital to pull the trigger at that moment more than anything else, just like a Texas cowboy

If we generalize a little bit, trigging is done after an algorithm, a logic, a decision making process. A good trig should be independent from this mechanism. You must first decide to shoot and after that pull the trig and shoot. The total duration to do this is yor response time infront of the threat directed to you. An other article of mine on how you can minimize this duration and the mental substructure of trigers will be available at in a short while.

It is possible to observe the existance of trigging mechanisms in every decision making process. To make a decision requires the evaluation of the available data and reaching a resolution at the end of this process. Reaching a resolution is the result of a TRIGGER mechanism. Large systems, pilots, air traffic controllers, firefighters, soldiers, doctors and other emergency personnel have to make decisions under stress. It is vital to have developed and prepared the correct TRIGGER mechanisms in these situations The responsibility of the training and support for the mental health of these professions is yet to be resumed completely even by the European authorities.

Trigging mechanisms are subsistent for our minds in the daily life The trig should be attached to a condition. Such as 'I will wake up at 6 O'Clock in the morning' or, 'I will forget everything related to the job at the entrance stairs of my Home, till I drink my coffee after the dinner and relax when it may come back if necessary' As it is called 'Niyet ettim yapmağa' ('I commit myself to do') in religious commitments.

Even though trig may be considered trivial at the first glance, it is something used unconsciously in the human nature, a vital instrument in our interaction with the subconscious and our automatic processes Wrong triggings may include suicides, deadly crimes and may cause unreversable loses and damage even in the social relations as seen in the assassination event at the beginning of the first World War.

Triggers are subsistent and indispensable. Trigger mechanisms are part of our natural beings as well as nature's. Human mind and brain and also social and economical events, overall the nature of matter

sustains trigger's abundance. As the son of a commando training officer who trained many 'trig like' (interalia) brave soldiers and, in the warm memories of what he chose to teach us; my wish from you and advise is; the person who has read this short article till its end can do much more than a simple trigger can and, I believe, you should.

Kind regards.

Ali R+ SARAL

<title>The Right of Time</title>

Time has its own rights. Humans, animals, nature, children, plants, almost everything has some basic rights. Time has its basic rights also

At the moment that an event takes place between two opponents, justice gets set as one is right the other is wrong or at least to a degree or on the basis of some limiting conditions. Among all these conditions time has a special privilege, it has a right also in establishing the justice.

After the initial conditions that establish the 'right' on the basis of justice, time begins to tick. If the conditions related to the dispute are dependent on time, at the end of a certain period of time the 'winning' side at the beginning may find itself as 'losing'

An other example from engineering: To solve a technical problem, it is not enough to know the subject You must do research and then analyse the problem, diagnose and locate the problem, etc You must put your time into solving the problem. In the beginning some problems seem impossible to solve but if you put the necessary time and may be some more it is certain you will solve the problem. It is only a matter of time. Because it is the right of time.

<title>The perception and assignment of meaning to randomness</title>

Somewhere on the Aegean coast of Turkey, two miniscule particles of sand lies together on the beach. Infact millions of them lie together there Is it a coincidence or contingency that they lie together? It is not even a coincidence. There is not any meaning to it. If you name it as coincidence it is because you percieve things a intentional or coincidence etc it is how you percieve things nothing else Also the words 'sand particle', 'beach', 'coast' would not exist and we would not name those 'things' as as such if we did not have a vacation there, if we did not come to meet these things There were not any coasts, sand dooms etc on the Mars or any planet till we, the human beings come and 'discover' them and gave them names

Perceptions lie at the bottom of every mental activity - including cognition in general. Nature builds intelligence based on perception. Once we meet the sand particles, and many of them, we simple see or feel the warmth of them. We do not assign any meaning to them at this phase. The necessity to tell

them or to remember them easily causes us to desribe them. Finally it is easier to give them a name. How we name things depend on how we relate to them rather than to their internal attributes.

The naming process causes us to use deeper levels of meaning as we get to learn more about things and the interaction between things develop. While there is a minimum common ground of the meanings of words, there still are different views to things which bring different meanings to their names.

Different levels of meanings create abstraction and the abstract names and concepts. This creates the possibility to use basic names with different meanings in different contexts.

The way we name sand particles on the beach displays our tendencies to name randomness. Some times we name random things as if they are absolute entities (accompanied with a strong sense of belief). Sometimes we do not care whether it is random or not and name the whole thing or process - as beach. Sometimes we get so high in abstraction that we name it as if from somewhere high in the atmosphere - as coast

The perception and assignment of meaning to ramdomness is a critical mental process which displays the strength and weaknesses of the individual human mind. It is no coincidence that the initial signs of many behavioral or clinic mental problems are related to the deficiencies in this area.

<title>A Few Notes on the EUROCONTROL Safety R&D Seminar</title>

Barcelona, Spain
25-27 October 2006

EUROCONTROL held a Safety R & D Seminar at Barselona late October 2006. This seminar took place in a decade that is marked not only by change in ATC technologies but also a continued trend of increase in air traffic. It must be noted that the increase in the air traffic is dramatic. For example the air traffic has risen from approx. 2000 flights per day to 4000 flights per day at KARLDAP central Germany and Europe. This is not a fast and natural load increase in a brand new system. The KARLDAP system is at the edge of a big transition to a brand new one and the technical staff is almost getting retired as a whole

Big investments are being made for new systems Yet Europe has seen her worst air traffic accident at Switzerland in this decade Managers need to have objective methods and tools to justify new costs The aviation industry is faced with increasing pressure to minimize its costs Rationalisation sometimes causes experienced ATCOs to work two shifts 8 hours per day as DSF did in late 1990s

These tendencies are reflected in the Swedish presentation on the Impact of change processes on safety culture and organizational climate and Swed Lund Operational Readiness in Transition and a not so good other presentation about the Switzerland accident Human reaction to safety nets

I have witnessed the German KARLDAP and Turkish systems and I have not been able to find a comprehensive definition of SAFETY in these places People are working with rule of thumbs and mutually FELT and SHARED feelings of safety but not objective understandings of it The traffic load is increasing substantially but no one can judge what is exactly safe and what is not - accept to a certain degree simulation guys
IATA comes into the arena with the IATAData driven approach to ATM Safety presentation in the EUROCONTROL seminar.

In order to measure whether a system is safe or not, one must first identify which risks associated with which hazards to measure Here comes a group of presentations, first two by NLR NLR Identification of emergent hazards and behaviour and NLR Identification of emergent hazards and behaviour, and a special case The Functional Resonance Accident Model and last one from FAA Human Error Safety Risk Analysis FAA Human Factors Research Group

Part of the problem arises from not having the data at all Confidential Reporting Reporting methods, organization and environment are important according to EUROCONTROL presentation which indicates a method and independent Safety Group organisation. Eliciting Info for Safety Assessment is a similar presentation

Once the data is gathered we have to assess it according to a method in order to evaluate the safety of our system NLR steps in once more with the NLR Need_for_novel_approach_to_aviation_safety_validation article along with resilience in safety assessment.

Safety culture is the key phrase that is most emphasized in the seminar presentations ATM Safety Maturity Model, Boeing Safety Culture Survey, Swedish safety management system, UK Safety Regulation Group presentation are noteworthy. I am impressed by the FAA, UK and NLR presentations but the Swedish quality and amount at most

<title>Emotion Regulation</title>

My quotations from:
Emotion Regulation: Conceptual Foundations Date: 3/22/06
James J. Gross (Stanford Uni), Ross A Thompson (Uni of California, Davis)
...
Emotion Regulation and Related Processes
...
emotion regulation refers to the heterogeneous set of processes by which emotions are themselves regulated. Emotion regulatory processes may be automatic or controlled, conscious or unconscious, and may have their effects at one or more points in the emotion generative process

Because emotions are multi-componential processes that unfold over time, emotion regulation involves changes in emotion dynamics (Thompson, 1990), or the latency, rise time, magnitude, duration, and offset of responses in behavioral, experiential, or physiological domains. Emotion regulation may dampen, intensify, or simply maintain emotion, depending on an individual's goals. Emotion regulation also may change the degree to which emotion response components cohere as the emotion unfolds, such as when large changes in emotion experience and physiological responding occur in the absence of facial behavior.

One as-yet unresolved issue is whether emotion regulation refers to intrinsic processes (Fred regulates his own emotions: emotion regulation in self), to extrinsic processes (Sally regulates Bob's emotions: emotion regulation in other), or to both. In general, researchers in the adult literature typically focus on intrinsic processes (Gross, 1998). By contrast, researchers in the developmental literature focus more on extrinsic processes.

Core Features of Emotion Regulation
...
Emotion Regulation and Related Constructs
..., we see emotion regulation as subordinate to the broader construct of affect regulation. Under this broad heading fall all manner of efforts to influence our valenced responses (Westen, 1994).
... affect regulation includes (among other things) four overlapping constructs: (a) coping, (b) emotion regulation, (c) mood regulation, and (d) psychological defenses.
...
Emotion Regulation Strategies
...These five points represent five families of emotion regulation processes: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross, 1998b).

...the first four emotion regulation families may be considered antecedent-focused, in that they occur before appraisals give rise to full-blown emotional response tendencies, and may be contrasted with response-focused emotion regulation, which occurs after the responses are generated (Gross & Munoz, 1995).

Situation Selection
The most forward-looking approach to emotion regulation is situation selection. This type of emotion regulation involves taking actions that make it more (or less) likely that one will end up in a situation one expects will give rise to desirable (or undesirable) emotions.

Another barrier to effective situation selection is appropriately weighing short-term benefits of emotion regulation versus longer-term costs. For example, a shy person may feel much better in the short term if she avoids social situations. However, this short-term relief may
come at the cost of longer term social isolation.

Situation Modification
Potentially emotion-eliciting situations - such as the approach of the terrifying barber in

the example above - do not inevitably lead to emotional responses. After all, one can always ask to wait until a less frightening barber is free. Such efforts to directly modify the situation so as to alter its emotional impact constitute a potent form of emotion regulation.

Attentional Deployment

Situation selection and situation modification help shape the individual's situation. However, it also is possible to regulate emotions without actually changing the environment. Situations have many aspects, and attentional deployment refers to how individuals direct their attention within a given situation in order to influence their emotions.

Distraction focuses attention on different aspects of the situation, or moves attention away from the situation altogether, such as when an infant shifts its gaze from the emotioneliciting stimulus to decrease stimulation (Rothbart, this volume; Stifter & Moyer, 1991).

Distraction also may involve changing internal focus, such as when individuals invoke thoughts or memories that are inconsistent with the undesirable emotional state (Watts, this volume), or when an actor calls to mind an emotional incident in order to portray that emotion convincingly.

Concentration draws attention to emotional features of a situation. Wegner and Bargh (1997) have termed this controlled starting of emotion. When attention is repetitively directed to one's feelings and their consequences, this is referred to as rumination. Ruminating on sad events leads to longer and more severe depressive symptoms (Just & Alloy, 1997; Nolen-Hoeksema, 1993).

Cognitive Change

Even after a situation has been selected, modified, and attended to, an emotional response is by no means a foregone conclusion. Emotion requires that percepts be imbued with meaning and that individuals evaluate their capacity to manage the situation. As described above, appraisal theorists have described the cognitive steps needed to transform a percept into something that elicits emotion. Cognitive change refers to changing how one appraises the situation one is in so as to alter its emotional significance, either by changing how one thinks about the situation or about one's capacity to manage the demands it poses.

One form of cognitive change that has received particular attention is reappraisal (Gross, 2002; John & Gross, this volume; Ochsner & Gross, this volume). This type of cognitive change involves changing a situation's meaning in a way that alters its emotional impact. Leading subjects to reappraise negatively valenced films has been shown to result in decreased negative emotion experience.

Response Modulation

In contrast with other emotion regulatory processes, response modulation occurs late in the emotion generative process, after response tendencies have been initiated. Response modulation refers to influencing physiological, experiential, or behavioral responding as directly as possible. Attempts at regulating the physiological and experiential aspects of emotion are common.

Another common form of response modulation involves regulating emotion-expressive behavior (Gross, John, & Richards, in press). A person may wish to regulate expressive behavior for many reasons, ranging from an assessment that it would be best to hide one's true feelings from another person (e.g., hiding one's fear when standing up to a bully) to direct prompts from a parent (e.g., in the barbershop example).

<title>MISSING SPACES</title>

The art of civilized manners depend on the skill of leaving space.

I grew up listening the stories of how my father saved the remains of a US airplane at Toros mountains sometime in 1950s. My father was a Commando training officer.

Once I asked him to teach me how to protect myself like a commando soldier. He refused basicly. He taught me how to leave space instead.

Isn't it the same when driving a car? You have to leave space Btw the car at the front and your own.

It is the same in air traffic control (ATC). The ATC controllers Communicate with the pilots and arrange things so that there is always enough physical space btw airplanes.

Actually, this space can be not only physical but also abstract. We must leave space fort he mistakes, weaknesses of others in order to be safe

On July the 15th, 19:25 O'Clock. Over Camlica hill at İstanbul I saw a 'heavily' loaded airplane, which may be THY If the structural capacity of a system is used fully for a long Duration, this means increased risk according to a normal load, Specially at landing in wet conditions, etc

I wish, his graceful excellency Mr. PUTIN could make An arrangement so that these people carrying goods in their Baggages would use other means that do not endanger Anybody. It is not fare to risk people's lives because of Confrontation or some other reason on both government sides.

The iron fist Russian rules mixed with weakness in authority at Istanbul may prove deadly.

What is the difference btw Rome and Istanbul? The public squares in Rome are much bigger. There are wide
Pedestrian areas and traffic crossroads in Rome. Something to think about for my fellow citizens. Strategic limits should be applied before it gets too late.

<title>THINKING STABILITY</title>
(draft)

Thinking stability is a phenomenon that can be observed in brain's cognitive processes. Stability is an issue in not only cognitive but also emotional processes. It is also possible to witness the word stability in relation with mental stability. On the other hand, stability is a recent issue in neural network models, which are supposedly the basis of brain's working. Philosophically, Sartre has pondered about a 'psychic balance' which has homeostatic limits.

Imagine a friend who has just returned from a long distance vacation and joined your company of three at a caffee She not only tells everthing she has seen but also changes the subject frequently and tells many unrelated things about her voyage. This is a socially common situation. If a firm context has not been established, the content of the talk can not have stability around a single subject.

You can observe the use of fluently changing subjects by some teachers. The teacher changes the subject so that, his pupil get the opportunity to look at the original subject matter from very different possibly almost unrelated viewpoints At the end, the teacher succeeds not to tell the fact but make his students understand the truth themselves.

Teaching is a strongly destabilizing process. Learning process requires instability by definition. We should open ourselves to new ideas and accept to discuss the strength of our old ideas. This causes instability both cognitively and possibly emotionally in the case of young people.

Whether done for voluntary or involuntary reasons, changing of subject with a not well formed context, or continuous changing of content are strong signs of the loss of thinking stability.

Thinking depth is the depth in terms of abstraction levels from the subject matter. For example, if you talk about a specific person and then make comments on the nature of women on general and continue on to the character of the human-beings, you have increased the thinking depth three levels of abstraction. Increasing the thinking depth unnecessarily or doing so in every little subject you talk about indicates there is instability in your thinking.

An other case is, the speaker does not increase the depth but gives many examples and continues to give details making the listeners bored. Thinking more than necessary details continuously etc. indicates that there is a problem in your stopping process of your thinking. Thinking stability requires enough details and economic use of mental energy so that there is space for continued mental activity.

Thinking happens in a social environment. If the speed of your information flow to the listeners is much higher than they can understand, this indicates an instability in your communication ability or the structure of your thinking. The functionality of the elements of your thinking and its general structure establish its stability.
The quality of thinking is also important. If you are speaking about a subject but can not reach a conclusion this may also indicate an instability in your thinking. A stable thinking should run into its end. In some cases, such as scetching in art or in brain-storming instability is required by definition.

A special case of thinking instability is remembering things from the past too many. A healthy, stable way of thinking does not get obsessed with the past, of course unless you are a historian writing a history book. Thinking stability requires a healthy balance in the sense of time; past, now and future.

Thinking stability requires a balanced approach to the importance of things in life, family, profession, nation, beliefs, ideas, feelings, everything. Getting obsessed with one of these for long durations hurts the thinking stability of that person. On the other hand, obsession is a precious mental tool that helps us to overcome difficulties. Some professions such as engineering, art etc. requires frequent use of obsessions. It is no wonder, a rate of thinking instability of varying degrees from utilization to mental instability is not uncommon in these professions.

Other than cognition, many examples for perceptional, emotional and motor stability, can be given. For example, sometimes you may need to move and do something continuously or you may answer and react to people extremely quickly and later on find you have said something wrong etc. These examples may be stretched from temporary behavioral abnomolies to mental stability problems in terms of health seriousness.

Loss of thinking stability as a continuous situation may be an indication of various mental problems. On the other hand, a constant strong stability in thinking may also be indicative of other mental problems. A healthy level of dinamism may be necessary to cope with the difficulties of life. The relentless change in our lives requires a certain level of elasticity in our thinking.

Unfortunately, the loss of thinking stability is a daily situation for many professionals from various professions, such as large systems operators, pilots, engineers, artists, musicians, etc. Thinking instability may be caused by creativity, continuous learning, long duration high concentration, decision making under stress working environments. The thinking instability caused by today's professions is also amplified by the obligation to learn and use 2-3 foreign languages at the same time, which is extremely destabilizing. Correct use of motivation, social environment, family may play the role of stabilizers on a daily basis for these professionals.

Thinking stability may be caused by increase in the thinking speed. SwitchCapacitor filters in electronics loss their stability when the sampling frequency or speed increases relative to the frequency they are desingned for. Similarly, our brain tends to function differently when it works faster. Changing subjects, thinking deeper are known phenomenons.

This is not enough to claim that every thinking instability is caused by some increase in the thinking speed. Neither can I claim that thinking speed increase is caused by the thinking instability But it is common that problems in thinking stability are generally accompanied by thinking speed problems. Thinking speed problems can also be related with the SPeaking speed. Similar to thinking stability, speaking speech problems can not be directly attributed to thinking speed problems. But in many cases, they look correlated. Moreover people speaking fast and thinking fast tend to change the subject too much or get too deep, namely they think instablely.

Thinking instability can most easily be detected from the thinking speed and actually the speaking speed. If your colleague is talking too fast continuously, regardless of the situation that may not be a good sign, although it looks like he is getting more clever or more effectively professional.

Trying to speak or think slowly to slow down your thinking may not help either. Thinking speed is adjusted automatically by your brain (probably subconscious), it is impossible to control it directly. There are some indirect methods to control it if things have not got out of control totally. In that worst case, keeping the thinking speed low may become more important than anything else.

I believe, the highness of thinking speed may not pose an issue as much as having all the tools and processes that enable it. These tools and processes remedy high thinking speed's bad effects automatically, afterwards with adequate relaxation. If you lose these skills because of excessive high concentration, it may become inevitable to gain somewhat time by any possible means to recover them again. Preserving thinking stability is a precious mental asset.

As a last note, I would like to define thinking stability in terms of thinking speed. I believe thinking stability is the ability to automatically adjust the thinking speed. Thinking stability is maintaining a healthy thinking speed which may change according to temporal situations that returns back to pivotal normal level afterwards keeping an affordably low average value overall.

<title>Ego-control and ego-resiliency</title>

My quotations from:

Ego-control and ego-resiliency: Generalization
of self-report scales based on personality
descriptions from acquaintances,
clinicians, and the self
2004

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Abstract
Ego-control refers to the inhibition/expression of impulse and ego-resiliency (ER) to the dynamic capacity to contextually modify one_s level of ego-control in response to situational affordances (Block, J., 1950, 2002; Block, J.H., 1951; Block & Block, 1980).
...

1. Introduction

Ego-control (EC) and ego-resiliency (ER) are conceptualized as central personality constructs for understanding motivation, emotion, and behavior (Block, J., 1950, 2002; Block, J.H., 1951; Block & Block, 1980). Broadly conceived and summarily characterized, EC refers to a meta-dimension of impulse inhibition/expression and ER refers to a meta-dimension of the dynamic capacity to contextually modify one's level of control in response to situational demands and affordances.

Overcontrolled individuals characteristically contain impulse and affect across situations, even when doing so may not be necessary. On the other hand, undercontrolled individuals characteristically express impulse and affect across situations, even when doing so may be inappropriate. Highly ego-resilient individuals are characteristically able to modify their level of control, either up or down, as may be appropriate or necessary according to the situational context. Individuals with a low level of ego-resiliency are more restricted to the same level of impulse containment or expression regardless of situational demands.

1.1. Ego-control

According to theory developed by Jack and Jeanne Block over several decades, the individual difference dimension of ego-control varies from overcontrol to undercontrol (Block, 2002; Block & Block, 1980). Overcontrolled individuals are conceptualized as relatively inhibited in action and affect-expressiveness to the point of at times being excessively constrained. They have difficulty making decisions, may unnecessarily delay gratification or deny themselves pleasure, are tightly organized, are insulated from environmental distractions, and are able to continue even repetitive tasks for long periods of time.

At the other extreme, undercontrolled individuals characteristically express affect and impulses relatively immediately and directly even when doing so may be socially or personally inappropriate. They are relatively unable to delay gratification, have fluctuating emotions, and are spontaneous, easily distracted, and relatively unbound by social customs (Block, 2002; Funder & Block, 1989).

The consequences of characteristic overcontrol or undercontrol may be adaptive or maladaptive depending on circumstances. Overcontrol may facilitate disciplined and directed behavior, which can be advantageous in some situations. In other contexts, where delaying gratification and pleasure is unwarranted or psychologically undesirable, overcontrol is likely to be detrimental to personal and often societal fruition.

In parallel, undercontrol can facilitate the expression of warmth, friendliness, and spontaneity, which are likely to be advantageous in promoting intimacy and the enjoyment of life. However, undercontrol can be maladaptive when it leads to erratic, unorganized, or dangerous behavior.

1.2. Ego-resiliency

According to the Blocks_ theorizing, ego-resiliency is the ability to adapt one_s level of control temporarily up or down as circumstances dictate (Block, 2002; Block & Block, 1980). As a result of this adaptive flexibility, individuals with a high level of resiliency are more likely to experience positive affect, and have higher levels of selfconfidence and better psychological adjustment than individuals with a low level of resiliency (Block & Kremen, 1996; Klohnen, 1996). When

confronted by stressful circumstances, individuals with a low level of resiliency may act in a stiff and perseverative manner or chaotically and diffusely, and in either case, the resulting behavior is likely to be maladaptive (Block & Kremen, 1996).

<title>On the Nature of Decision Making</title>

The difficulty of making decisions can be made easier by choosing the right decision process. The approach, the epistemology of decision making has to be correctly chosen to make a difficult decision.

We have developed various techniques for making difficult decisions. Partial decisions, delayed decisions, temporary decisions, imperfact decisions, incomplete decisions, reduced decisions, extended decisions.. When studied closely each of these make decision taking easier.

Partial decisions may be implemented in many ways. The basic principle is dividing a difficult task to smaller pieces. The decision may be taken as an aggregate of decisions made on various parts of the main task. The sub divisions may even be given by different individuals. A decision may be divided to subdecisions which are spreaded through time. This may be useful for time dependent tasks. Flight Plan Processing uses this tecnique for ensuring the safe surveillence of air craft.

Delayed decisions also help to clarify complex situations and minimize risk. Air traffic controllers try to delay their decisions as much as possible to avoid unnecessary moves and reduce risk.

Temporary decisions are used when nothing is clear but something has to be done. The chances are your choice may be correct. It is used emergency situations. Temporary decisions are used by companies when they do not have the ability to see the economic situation or the situation of their operations.

Imperfact decisions are made when the ability of the workers or company is not enough. An imperfact decision is taken nevertheless to continue working and improve it ASAP.

An incomplete decision is not an imperfact decision. You make an incomplete decision with open options to be selected later on. It is used when flexibility is required.

Reduced decisions are logically reduced from the required decisions. They are not necessarily the same as the original decision but its results give the linearly independent items of the original decision.

Extended decisions may make things easier by enhancing the results area of the original decision.

It is not enough to educate and train students who can just think excellently. Students of mentally demanding professions should be trained to develop skills and habits of how they can reduce their load of thinking.

<title>Yüz İfadeleri - Facial Expressions</title>

<title>TO FEEL RIGHT?</title>

What does it mean 'to feel right' or 'to feel the right emotion'? Can we have an objective judgment on this? What good will it do after all? Will it help us to increase the quality of our lives? Will it help special people as air traffic controllers, nuclear plant or transportation systems operators, large systems engineers in coping with the difficulties of their jobs?

If most of the people watching a movie feel the emotion of sorrow, and you also feel sorrow, that means you feel the right emotion or at least the socially acceptable emotion. This is a great simplification, though. If you are a foreigner, you may not understand the jokes in a movie and you may not laugh when others do An other example, from the point of precision or repeatability could be; You should feel approximately the same emotions everytime you watch your favorite movie This is also a great simplification because it does not take into account the time and the accumulation of experience and knowledge(and sometimes boredom).

To feel the right feeling depends not only on the precision but also on the accuracy. What you feel should be 'appropriate' to your personality and to the situation that you are in. I may be getting dangerously subjective, I know. What is appropriate may change according to time, society, individual, family, culture, education etc But still, there is a limit to appropriateness
The sense of self sets a rough border to what is appropriate and what is not.

'Is this me who feels this?' is the golden question to ask. But even then, self is not a constant, undeveloping, non-spontaneous entity. So, I admit, my starting question does not have an objective answer, I deeply doubt it has any either.

Please, let me change my question then Why can't we decide we feel right or wrong? Unfortunately for me, the answer of this question has been given well ahead.

Sartre has stated that 'emotional conciousness is non-reflective at first'. He says 'The emotional consciousness is primarily the consciousness of the world'. So, when you feel afraid of something you get under its magic effect which causes you to concentrate on it more and more rather than percieving your own self and situation. In his 'Sketch for a Theory of the Emotions' (Translated by Philip Mairet - Routledge Classics) Sartre states in fact ' The self does not appear at all in ' this type of automatic process.

The reason we do not feel whether our feeling is right or wrong is, feeling is not a reflective process. Sartre chooses not to call it an automatic process. He says 'unreflective conduct is not unconscious conduct'. The unreflective character of feeling can be observed in the situation where you become aware of your feelings. For example, when you become aware that you are very angry, your feeling disappears.

If it is impossible to decide whether our feeling is right or appropriate how come so many people happen to feel the same and mostly the 'right' feeling? It may be related to the way we learn our feelings first of all. The first feeling we learn is 'trust'. We human beings develop the feeling of trust by getting 'feeded' regularly by our mamas in the beginning of our lives. It's no surprise getting regular good food is critically important at large systems, ATC centers etc., where everthing is designed on a single human feeling, namely 'trust'.

Secondly, our emotions are continuously conditioned by life, by the society we live in or the team we work in etc... The culture that we live in sets the noetic thresholds for our emotions. My Singaporean fiancee once had mentioned 'Everything in Turkey is hyper! Even the cows in the picture on the milk bottles look hyper!'... The character of a people is set by its culture. Music, in all cultures, teaches and conditions people to what should be expected within a given mood.

Sartre states "In a word, to experience any object as horrible, is to see it against the background of a world which reveals itself as already horrible." Sartre does not mention mood in his book but I believe what he calls at the very end of his sketch as 'background of a world' can also be related to 'mood'.

If we are conditioned to feel certain emotions under certain conditions or moods, the new question should be "Would it be possible to bring ourselves up to become a better self or a better ourselves?". And "Would it be possible to better train so that large systems engineers, ATCOs, pilots and other large systems operators feel better while they are doing their jobs, react to emergencies much better and faster so that they be more successful in their professions?" I believe, Sartre's 'Sketch for a Theory of the Emotions' is a precious legacy which must be studied by the aviation community, specially the trainers and teachers and their training institutes.

Sartre's work helps us to understand ourselves better, consequently, to know.

Ali R+ SARAL

<title>THE FUNCTION OF SYMBOLS IN ATC AND ITS MENTAL EFFECTS</title>

INTRODUCTION

Miller's rule states that a human can handle seven plus minus one things in his/her mind at the same time. If the number increases the human mind groups these items so that the number of groups remain less than seven plus minus one(attention span).

Grouping things according to a certain point of view is called abstraction.You can group things first than you can group the groups you have formed and so on. Every step of grouping in this process is called an abstraction level.

Whenever the human mind tries to handle things that overpassess its capacity to handle things simultaneously

it does abstraction. Air traffic control(ATC) is no exception of this fact. ATC systems are complex discrete event dynamic systems. These systems are huge in the sense that they can handle the whole air space of large countries such as Germany or Turkey.

An air traffic control system ensures that airplanes move safely from one geographical point to another. In order to do this each airplane's safety is given to the responsibility of an air traffic control officer (ATCO) at each point of time in its journey.

The complexity arises from the fact that you have to establish areas of control responsibility for each controller. An ATCO can handle upto 12-13 airplanes at the same time depending on the size of its control area and density of the air traffic. So, in order to control an air space as large as Turkey there must be quiet a number of control sectors. Actually, you generally have first, a number of air spaces depending on the geography and the height, such as eastern Turkey, western Turkey air spaces and lower air space and higher air space which may be divided at flight level 280. The more the number of sectors the more difficult it is to assign tasks to these sectors in coordination with others.

It is inevitable to use abstractions when one just imagines the complexity and the size of an ATC system and the risks involved with it. The first abstraction is the types of control, such as area control, approach control and tower control. The type of the traffic specifies the character of the system that handles it. For the sake of simplicity, and due to my experience I will mention only the area control from now on.

THE USES OF SYMBOLS

The human-kind expressed itself with symbols long before he/she found the letters and writing[1]. Symbols provide a visual representation of an idea or word as can be observed in Far Eastern alphabets and languages. The symbols played a vital role in the development process of alphabets. One can only imagine a little bit the difficulty people experienced in inventing a language first, then writing and then creating an alphabet. But it should be simple even for a dummy to appreciate the importance of using symbols in our life to fight against the difficulties that we meet.

Symbols provide a visual representation of an idea or word. Children who find difficulty in reading can be helped to visualise the meanings of words by seeing a symbol. Symbols In Education - Why we use symbols [2].

Unlike things, feelings and ideas are difficult to exchange. People wishing to exchange physical objects may simply hand them to each other. Feelings and ideas, however, are without physical substance. They cannot be handed directly to another person. Rather, they must be exchanged through the use of symbols-things that represent or stand for other things.[3]

The origins of our existence, the meaning of life und so weiter are no simple things to handle and this situtaion is not an exception to our ways of handling difficulties. For example : The concept of using images in worship finds its origins in the Old Testament. The Temple contained numerous visual images, including the cherubim on the Ark of the Covenant. The Temple Solomon built for the Lord contained many carvings of trees, gourds, flowers, and angels (1 Kings 6). It is clear that God did not forbid images used in the Sanctuary to glorify God[4].

Abstraction and the use of symbols are vital elements in solving math problems or others in science. The use of arbitrary symbols and the process of symbolisation have made possible the discourse of modern mathematics and logic. Mathematics uses symbols in creative ways. Two such methods, one

dealing with the process of `alphabetisation' and the other based on the notion of `formal similarity', are described. Through these processes, originally meaningless symbols get embodied and coded with meaning through mathematical writing and praxis[5].
We use symbols when things are difficult to rxpress such as feelings, like a red rose for a lady. Arts is a wide spread application area of this use of symbols. In the play Macbeth, Shakespeare uses many symbols to add to his story. His use of blood, water, light, dark, rampant animals, and even the witches are examples of how he used symbols to add depth to his play. These symbols were often times recurring and they were all related to the central plot of the play[6].

THE FUNCTION OF SYMBOLS

1- Symbol extracts what is important - relevant and preserves it
2- Symbol makes it reacheable against all odds its a KEY
3- Symbol provides insulation - better cooperation at the related levels.
4- Symbol provides preservation.
5- Symbol increases processing speed.
6- Symbol decreases mental workload and the amount of relevant speech.
7- Symbol provides space for future enhancements by making abstractions.

THE USE OF SYMBOLS IN ATC

The air space used by the airplanes have to be abstracted so that a human being can easily manage the airplanes flying in his own area of responsibility. Simply this means a map but that does not suffice alone

You must abstract the height, the third dimension in a humanly controllable manner: This means flight levels. The height difference between FL's are something around 300Ms. Breaking the third dimension to constant and seperate flight levels gives us many facilities: the ability to fly at a certain direction at each level, given a certain filight level you do not have to worry on vertical seperation, limitation references for ascends and descends and many more

After you have the airspace map, you should choose reference points to fly from and to fly to, also reference points where certain actions have to be taken such as entry and exit points where adjacent centers or sectors have to be acknowledged

If you think about the size of the German air space, and the number of planes flying concurrently, you can quickly appreciate that a single controller is vital but totally insufficient to do the job. A single ATCO can control 12-15 aircrafts(A/C) at the same time. So you must divide the airspace into enough small sized sectors to reduce the workload to humanly manageable levels. Once more we made an abstraction and created sectors.
Each sector has a symbol, a few characters long to symbolize the section of the airspace they stand for.

An other abstraction is done to facilitate the route declaration in the voice and electronic communications.

Instead of telling each point the A/C is going to fly over, the pilot says uppergreenone (UG1), this indicates a sequence of many points in direction depending on the departure and arrival airport. Each route has a symbol like UG1 which identifies it.

All the symbols used in ATC, points, routes, and their attributes such as entry(NP),exit(XP) etc. are identified in a static data storage or Static Data Bank(SDB). SDB is the symbol of the Static Data Bank. The marvelous character abstraction is you can do abstractions to create the entities that are used to make abstractions of the real life. The Term SDB is used by both ATC interface people who change the static properties of the system and also by the engineers who maintain the software system that supports the operations. The world of the ATC engineers is a complete abstraction full of symbols, actually they use online dictionaries while it is impossible to remember everything.

SDB handles the static properties of the air traffic. The dynamic properties of the air traffic is handled in the Dynamic Data Bank - DDB. Flight level changes, mid air entries, category changes, speed changes usw. all are recorded in the DDB. DDB is an abstraction of the dynamic attributes of the air traffic. It is defined via many symbols that reflect these attributes.

Actually the ATCOs are generally not aware of what is in DDB or SDB. They use other abstractions and many symbols. A flight plan is an abstraction of what a pilot tends to do with his airplane indicating departure and arrival aerodromes, speed, height over all the route points, route, time schedule etc. Strips are small strip of paper which outlines this information in this small area with many symbols. The area must be as small as possible because of the spae limitation on the ATCOs control table. The controller has also the keyboard and display system, the radar screen and ATN messages to use. All of these are highly abstract modellings of the real life air traffic. All of them use many symbols.

THE ROLE OF SYMBOLS IN ATC

From the point of an air traffic controller using symbols is not only being able to identify them but also having the right feel of them. Aviation is not only a science based technological area but it is also an art and air traffic control is no exception to that.

The use of symbols makes things more identifiable and increases comprehension by the use of phrasepology in the pilot - controller voice communication. An air plane appears as a small symbol and a vector indicates the direction and speed it flies on the radar screen. There is height, speed etc data all written as symbols + numeric values The static control points, airports etc. all are indicated as symbols. There is even a book of ICAO which you can find these values.

But, the controller is not supposed to see all these symbols and overabundance of information, in all this mass, he simply has to keep the mental picture of the traffic in his mind. Similar to a theatre artist, he should not try to remember the text or what movements he should do, he has to keep his audience going according to the point where they are in the act.

This is also reflected in the evolution of a controller. He begins with the easiest sector and like performer he rehearses his role many times and gets to know the stage he is acting. If you remember my example about the use of symbols in Sheakspear plays, symbols help the controller to get hold of the

reality, the actual reality at that moment of time during the play Symbols play a crucial role in helping the air traffic controller to do so.

THE EFFECT OF SYMBOLS ON THE ATCO FROM THE POINT OF SYSTEMS PSYCHOLOGY
The use of symbols reduce the mental load of the air traffic controller. Unfortunately, the homeostatic tendency and ever increasing traffic load causes the air traffic controller get more load in this situation. At the end of the day, the use of symbols causes the air traffic controller to get more traffic load.

Similarly spatial processing increases the load of the controller instead of decreasing it. Large radar screens provide ample space to hold many more symbols, tables, etc.

One important point to remember; symbols contribute to our subconscious. Anything we do not understand goes to our subconscious. When concentrating on a traffic situation both on voice and radar a controller's subconscious gets busy with the other things, and these are symbols which he does not have attentional resources to deal with. So, they go to the subconscious. Just like watching and art work that you do not understand.
You try to make an abstraction to overcome the difficulty you face by pushing that thing into your subconscious.
If you know how to interact with your subconscious then your subconscious will pop up the problem back to you, and in percieving the problem once more you will have formed abstraction of it, namely ah that flight that ı skipped.

In fact, symbols are the key to understanding the character of air traffic control. Phraseology reminds me abstract languages, the rule based structure the logic, all the symbols on the radar screen and the slow stepwise movements of airplanes has a certain lyric effect almost poetic, and the strength of symbols has a religious tone, with all the controllers and engineers walking slowly in and around the control center like the Branchid priests serving at the antic oracle's Didyma.

KAYNAKLAR:
[1] The Park Ridge Center,
Before the written word, human beings used symbols as the primary means of self-expression. Hope and fear, joy and sorrow, sickness and health, love and hate, good and evil, yin and yang, feminine and masculine all found early expressions as symbols.
[2] Symbols In Education - Why we use symbols
Symbols provide a visual representation of an idea or word. Children who find difficulty in reading can be helped to visualise the meanings of words by seeing a symbol.
[3] Britannica Student's Encyclopedia
Unlike things, feelings and ideas are difficult to exchange. People wishing to exchange physical objects may simply hand them to each other. Feelings and ideas, however, are without physical substance. They cannot be handed directly to another person. Rather, they must be exchanged through the use of symbols-things that represent or stand for other things.
[4] The use of Images, Signs, and Symbols in Anglican Worship By
The concept of using images in worship finds its origins in the Old Testament. The Temple contained numerous visual images, including the cherubim on the Ark of the Covenant. The Temple Solomon built

for the Lord contained many carvings of trees, gourds, flowers, and angels (1 Kings 6). It is clear that God did not forbid images used in the Sanctuary to glorify God .

[5] The Use of Symbols in Mathematics and Logic by Sundar Sarukkai

Abstract. It is commonly believed that the use of arbitrary symbols and the process of symbolisation have made possible the discourse of modern mathematics as well as modern, symbolic logic. This paper discusses the role of symbols in logic and mathematics, and in particular analyses whether symbols remain arbitrary in the process of symbolisation. It begins with a brief summary of the relation between sign and logic as exempli_ed in Indian logic in order to illustrate a logical system where the notion of `natural' sign-signi_ed relation is privileged. Mathematics uses symbols in creative ways. Two such methods, one dealing with the process of `alphabetisation' and the other based on the notion of `formal similarity', are described. Through these processes, originally meaningless symbols get embodied and coded with meaning through mathematical writing and praxis. It is also argued that mathematics and logic di_er in the way they use symbols. As a consequence, logicism becomes untenable even at the discursive level, in the ways in which symbols are created, used and gather meaning.

[6] ESSAY SAMPLE ON "THE USE OF SYMBOLS IN MACBETH" The Use of Symbols in Macbeth

In the play Macbeth, Shakespeare uses many symbols to add to his story. His use of blood, water, light, dark, rampant animals, and even the witches are examples of how he used symbols to add depth to his play. These symbols were often times recurring and they were all related to the central plot of the play.

<title>SITUATION AWARENESS IN THE MAINTENANCE AND ENHANCEMENT OF ATC SYSTEMS</title>

This is the third of my four articles serie on FALSE SENSE OF SAFETY in the Air Traffic Control systems. The fourth article will be on the "Passenger's Right to Know"...

I would like to draw your attention to a brilliant article on the situation awareness of the air traffic controller:

ATTENTION DISTRIBUTION AND SITUATION AWARENESS IN AIR TRAFFIC CONTROL
by Endsley and Rodgers (1996).

You can find this article on the internet.

Endsley and Rodgers article is about a scientific experiment done to measure the situation awareness of air traffic controllers. "A study was conducted to investigate the way in which controllers deploy their attention in processing information in en route air traffic control scenarios.(1)" The article is 4 pages long and explains clearly the terms and conditions the test was made.

The test procedure was described as: The subjects do normal controlling in an area for which they were licensed. "Each scenario consisted of a recreation of the ten minutes immediately prior to the occurrence of

the OE(operational errors). Twice during each scenario, the recreation was halted and the screen blanked."

After that:

"Subjects were asked to indicate the location of all known aircraft on the map, and, for each aircraft, to indicate or make a judgment of:

(1) if the aircraft was:
(a) in the displayed sector's control,
(b) other aircraft in the sector not under sector control, or
(c) would be in the sector's control in the next two minutes,
(2) aircraft call sign,
(3) aircraft altitude,
(4) aircraft groundspeed,
(5) aircraft heading,
(6) the next sector the aircraft would transition to, (7) whether the aircraft was climbing, descending or level,
(8) whether the aircraft was in a right turn, left turn or straight,
(9) which pairs of aircraft had lost or would lose separation if they stayed on their current (assigned) courses,
(10) which aircraft would be leaving the sector in the next two minutes,
(11) which aircraft had received clearances that had not been completed, and, for those, whether the aircraft received its clearance correctly and whether the aircraft was conforming to its clearance, and
(12) which aircraft were currently being impacted by weather or would be impacted in the next five minutes."

The article describes the results and evaluation also:
"RESULTS AND DISCUSSION
Subjects' responses to each question were scored for accuracy based on computer data for each aircraft at the time of each freeze. Responses were scored as either correct or incorrect based on operationally determined tolerance intervals. Missing responses were scored as incorrect."

You can find the complete article at:
http://www.satechnologies.com/Papers/pdf/HFES96-ATC-SA.pdf

My point is: A similar experiment could be done for measuring SITUATION AWARENESS IN THE MAINTENANCE AND ENHANCEMENT OF ATC SYSTEMS. As an example, I will state below a number of SA criteria similar to the above given...

The persona who should be taking the test are:

1-Operationally responsible person from the software maintainer/developer

2-Operational interface person between the operational institution and the software maintainer/developer
3-their first aids or replacements
4-software configuration's responsible person
5-version control's responsible person
6-various group supervisors who are also quality inspectors such as Radar, FPP and ATN groups.

The questions they should answer could be:

1- How many releases are released in the last six months, one month, last week respectively?
2- How many errors and system abends were done for each month and each release in the last six months,
one month, last week?
3- How many operational deficiencies are solved in each release in the last six, one months and last week?
What are the operational and technical difficulties of these according to a well established complexity criterium? (system LOC, change LOC, system complexity, changed region complexity).
4- What structure and content has the release? Multi-changes, small changes, big changes etc.
5- What direction is the system maintenance effort cruising in terms of four items above? More difficult, same or relaxed?

Human factors
1- What is the motivation level in the software team? Specially people who work on the current changes?
2- What is the number of hospital visits, doctor visits, nervous breakdowns in the team?
3- What is the number of sick days taken of by the software personnel?
4- What is the number of leaves taken from annual vacation?
5- What is the number of days that could not be used for vacation leaves although they were used?
6- What is the number of official complaints or telephone calls to the welfare services?
7- What is the total duration of time spent in technical and other meetings, including official but personal
ones?
8- What are the number and duration of telephone calls made in the team?
9- What is the daily and total working duration?
10- What is the number and duration of lates at lunch and other breaks?
11- What are the number of quarrels and heated discussions in the team?

Weather conditions
1- last week (sudden changes?)
2- at the planned time for the release.

Adjacent centers and other affiliates
1- Communication conditions

2- The availability of service at the adjacent centers 3- track record of adjacent centers' availabilities at that
time of the year

Military conditions
1- the level and quality of interaction with military
2- temporary reserved area situations
3- communication lines etc quality

Availability
1- system availability: hardware, planned maintenance etc.
2-personnel: leaves, new policies such as
personnel reduction, service time increase etc.

Airmisses
1- number of at that time of the year
2- track record of airmisses for the last
six months including the recent

Traffic
1- Number of flights:general, sector, point
2- Flights at that time of the year and at that hour
3- Number of special events at that time of the year
highjack, emergency sicknesses etc.

Flights of airlines involved
1-Airlines related with scheduled flights at the release moment

Night - day conditions

Operational team - controllers' condition
1- strike
2- reduced team for some reason
3- workload and experience of the controller directly involved.
4- personal condition if any of the controller

As the saying goes "You can not manage if you can not measure". These questions and possibly others have to be detailed and distributed to the related members and supervisors of the ATC software-maintenance team. They should regularly answer these questions and an automatic system should produce a single number indicating the RISK of realising the changes at that moment of the time.

This number could be conveyed to adjacent centers so that they could calculate their own risks. All of this is possible and meaningful in relation to a series of values taken through the time(as in (1)).

These are simple principles to think but very "complex" things to realise. The reason behind this is ATC people are generally "too busy" and "overloaded". Namely, their motivation is low.

If anybody had known there were 3 levels of maintenance or tech problems going on in Switzerland, they would not let an airplane full of chieldren go there... People SHOULD HAVE the RIGHT TO KNOW. And we the engineers should provide the existing information with due transparency and respect to human life.

Kind regards.

Ali R+ SARAL

Note:
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<title>DO COMPUTERS FEEL? (1500 words)</title>

To Dr. David B. Williams,
ORAT, Illinois State University

Does computer feel? Does computer have emotions? Does computer feel joy, love, anger, fear, and others? Is the effect of the feelings of computer on its behaviour pleasent or unpleasent, mild or intense, transient or long-lasting, and as interfering with or enhancing [1] ? Do computers 'experience emotions'? Do they react toward things in the environment that have such emotional qualities as frightening, cheering and saddening?

Schachter states an emotional state may be considered a function of a state of physiological arousal and of a cognition appropriate to this state of arousal. The cognition, in a sense, exerts a steering function. Cognitions arising from the immediate situation as interpreted by past experience provide the framework within which one understands and labels his feelings. It is the cognition which determines whether the state of physiological arousal will be labelled as anger, joy, fear, or whatever. [4] Many more definitions of emotions have been made through the history beginning with 2nd cty BC, Aristotle. Descartes, Hume[3] , James, Cannon, Dewey[2], Freud, and many others.

Do computers have an 'inner' sentimental world? Too difficult to answer quickly May be we should change the question a bit Does any being except the human have feelings? Maybe the better: Do animals have feelings? Darwin writes about most of the expressions and gestures involuntarily used by man and lower animals, under the influence of various emotions and sensations. [5]

None of the animals can say I feel sad. Nevertheless, when a cat approaches a person sitting at a garden caffee, it bends its head to the ground and imitates as if it eats something. A careful observer may understand the animal needs food. Animals can communicate their needs. The problem is, most of us do not percieve the messages they are able to give. We should not judge neither animals nor computers as insensitive because they can not express themselves with the same emotional vocabulary as us the human-beings

Does this situation provide enough validity to the claim that 'Computers do not feel'? Is there something wrong here ethically? Do we loss anything because of this silent assumption in our relations with computers? Are the Human Computer Interaction classes in many universities well equipped or even down-played as not technical enough? Why do many engineers and large system operators suffer from long duration high concentration jobs in front of their computers?

Indeed, computer does not have a face. A face like a human or even a mammal. It does not have eyes, ears, a skin, a head or a body Wait a minute Are you sure that computers can not see, hear or touch? What about scanner, microphone, keyboard? Computers do have many interaction functionalities similar to those that basic human senses provide.

The crux of the issue of 'Do computers feel?' is: Is it possible to think without feeling? Can cognition exist without emotions? Can you think even mathematics without feelings? Even if we assume that you really did not feel anything while solving a problem, you would still need to discharge the unused mental energy in some way. You might experience pride or humility depending on your success.

Even if you have the professional power to control everything, you must experience feelings when you are working in a cognitive job, like programming or air traffic control (ATC) You can not avoid the pleasure from simple matching [6] . Otherwise, you may be working against the nature of thinking and you may hurt yourself mentally. In fact Winkielman [8] states affective responses may also result from the dynamics of information processing itself. ,[7], High fluency elicits positive affective reaction. [9]

The mechanics of the thinking process is affected by our emotions. Switching from one context to another, the rate of changing subjects, the amount of concentration, the depth of thinking through different abstraction levels, getting obsessed to solve the problem, thinking speed are dramatically affected by the affective situation we are in while thinking The various glands of the endocrine system release hormones into the bloodstream that have effects on specific sites in the brain, including those involved in emotion says Cornelius [5] . There are different speed modes of thinking in our brains. Our brains work in a slow mode when we are doing something related with safety (not emergency) where as our ideas fly when we are doing something sentimental or dreaming Thinking speed helps us to switch

from one processor to another in our multiprocessor brain. Feelings and selecting the right mood help us to choose the right processor combination to do the 'thinking'.

Freud states ideas are cathexes-basically of memory traces- whilst affects and emotions correspond to processes of discharge, the final manifestations of which are percieved as feelings. [11] Hinde asks Is it an intervening variable or a hypothetical construct? [12] and argues that emotion is best defined in terms of chains or loops with emotion and cognition closely linked. [12] I believe, to reach a a conclusion on the question of Do computers feel? we shall have a look at the LINUX operating system books

An interrupt [13] is usually defined as an event that alters the sequence of instructions executed by a processor. Such events correspond to electrical signals generated by hardware circuits both inside and outside of the CPU chip. interrupt signals provide a way to divert the processor to code outside the normal flow of control. When an interrupt signal arrives, the CPU must stop what it's currently doing and switch to a new activity;

If we make an analogy between Dewey's emotion definition and work on the example of a touch to the keyboard; (1) the feel's name is keyboard interrupt (2)purposeful behaviour is the interrupt handler program of Operating System (3) an object that has an emotional quality is the person who touches, namely the user. Dewey's Calm and Violent emotions is analoguous to soft and hardware interrupts The basis of the similarity between the human emotional system and the computer interrupt system arises from the very nature of cognition. Cognition can not exist without some sort of interaction with living matter.

Interrupt subsytem of computers is similar to the human physiology: Both the hippocampus and amygdala are complexly interconnected with inputs from both the sensory organs and the viscera. They, and perhaps other structures of the lymbic system, appear to integrate sensory information with information from the various organs of the viscera as well as feedback from the ANS to control the output of emotional expression in the ANS and other parts of the nervous system (LeDoux, 1986 Neurobiology of Emotion). [14]

The nature of interaction requires the existence of a mechanism which processes the inputs from the sensory organs [14] When you touch the keyboard or click the mouse, press the Esc button, put a CD in the driver etc. the hardware connections, Interrupt Request Lines that carry this sensory signal instinctively work and trigger the interrupt controller, analogous to the amygdala
The interrupt controller trigs the operating system very similar to the senses trigging emotions. The normal cognitive processing comes to a halt and the operating system runs the related interrupt service routine, which has a label analogous to Weyle's feel When the interrupt service routine does the task, for example writing to the disk, then returns back information about its success
By the way, when the computer writes to the disk some trembling and noise indicate a similar situation to human arousal

Aesop's fable says; the fox tries to reach the grapes on the wine, but it can not. He says They are sour anyway. Sartre suggests in emotion it is the body which, directed by consciousness, changes its

relations with the world in order that the world may change its qualities. [15] □ When the computer meets a situation that it can not healthily handle, for example a division by 0, it issues a division exception and diverts the program execution to the related interrupt handler rather than abnormally ending□

Our initial question was □Do computers feel?□ My answer is 'no' because they can not express their feelings with the same □feels□ as humans, such as anger, fear. On the other hand, computers do have an embedded interrupt and exception system in soft and harware which is analogous to the human emotional system□

Then if my answer is 'no', why did I write this article with such an ambition? Because, the question □Do computers feel?□ is wrong □ A not so bad question chould be □Why don't computers have emotions like us?□ After all, it is us who have created computers with the knowledge and wisdom passed down from the distant past□ Many man-years have been spent to create operating systems but relatively less on the effects of it on its users.

Large and complex systems such as ATC systems demand long duration high concentration working from engineers and controllers. I wish □Computers could feel□ so that their users do not lose their feelings working with them□

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<title>Automatic Processes and Speech</title>

Language
perception is a semi-automatic process.
When we listen some one's speech we understand key words first and put
them on the premises of a context. The
rest of the sentence or phrase comes automaticly. We do not try to understand every and each
word we hear.

Speaking
fast does not mean to hurry everything you say but to slow at the critical
points and then throw down the rest at an incredible pace. Increasing the speed in any mental process
means the conversion of the process from a controlled one to an automatic one.

Listening a
fast speech in this style is also easy to keep track of because the perception
process will also get automatic and automatic processes are easier than
controlled ones.

If I allude
once more to my previous notes[1,2], some jobs that require continuous and
heavy attention for a long duration may hurt the employees' natural mental
balance of controlled vs automatic processing.
In this case, people begin to speak slowly as well as moving slowly. Feeling difficulties in speech can be
observed for long durations even after this type of service.

Using/studying
more than 3 to 5 languages concurrently may also hurt the natural automaticity

of speech.

Ali R+ SARAL

[1]
[2] On the Interaction of
Automatic Processes with Consciousness

<title>HOW TO PREDICT AIR MISSES</title>

HOW TO PREDICT AIR MISSES

by Ali R+ SARAL

ABSTRACT : A method to predict the number of air-misses in a certain time duration and region based on performance, reliability, complexity and weather factors of an Air Traffic Control system.
KEYWORDS : ATC, air traffic control, vertigo, metrics, airmiss

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It is fatally important to ponder on the issues of Air Traffic Control (ATC) where the development pace of the available technologies may have overcome the development of the systems available and the belief in the unity of support to the people in the air is incidentally hurt in the wake of the recent air traffic accidents. I believe it is critically important to have the scientific communities' support and wide contribution in order to overcome the challenges that are coming ahead, the difficulties in the cooperation of Short Term Conflict Alert displays this alone.

This article proposes a prediction method to find the number of air misses in a given duration of time in a certain region. If it is applied concurrently and coherently it may point at where the first accident lying ahead is likely to happen. It depends on the fair and precise measurement of the controllers', ATC centers', airlines', technical support and systems' performance factors and the weather factors. The details of these metric values may be the subject of another article.

Air traffic control (ATC) system is a dynamic system. ATC system's behaviour changes through time according to the changes in the input and system parameters. In fact, 'the evolution of ATC system in time depends on the complex interactions of the timing of various discrete events' (1), such as the entry of many aircrafts in a certain period of time into a certain control region and the exit flowing rate of

these aircrafts and how the ATC system reacts to this traffic both psychologically on the control team basis and the availability of the technical infra-structure of the system as a whole.

A mathematical model of an ATC system is given in equation [1]. This equation provides a metrical method, which may help to overcome the 'vertigo effect' of ATC, namely 'the false sense of safety'. Similar to any metrical value this equation may help to indicate the direction if not the value of the change of safety in the air provided that it is applied with vigorous consistency.

$$amiss = [\, 1 - K * p * r * (1 - e * w\,] * trd * dur \quad (1)$$

amiss # of air misses for dur
trd average # of flights per day for the controlled duration and region [real num / day]
dur total flight duration
p performance factor
r reliability factor
c complexity factor
w weather factor

K is a constant determined by the complex interaction of p, r, c, w. It reflects the composite effect of these factors. K can be determined and improved by using legal recording and other data.

a is a constant that determines the sensitivity of the traffic problem domain to the complexity of the ATC system. It may be determined heuristically in the beginning.

p,r,c,w are assumed constant for dur

0
1- p(t) indicates performance factor which is calculated from the daily measurement of the control center, airlines and the airport performances.
2 - r(t) indicates the reliability of the ATC center availability or some of its facilities, the reliability of the airlines and the airports.
3 - c(t) indicates operational complexity such as route complexity, operational complexity and the technical system soft-hardware and support-development complexity.
4- w(t) indicates the risk affect of repeated or random weather difficulties in the controlled region.

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<title>Mental Risks of Working on Large Systems</title>

Working on Large Systems is a serious commitment which may end up with various disasters. I will mention only three of the mental risks that may cause burn-out in the simplest possibilities or serious psychotic problems.

Norepinephrine - cortisol interaction in chronic stress and sudden demotivation cases.

Under acute stress think fight or flight the hypothalamus churns out corticotropin-releasing hormone, prompting a sharp rise in the stress hormone cortisol, which enhances immunity, memory, energy and cardiovascular function. Once the stressor has passed, the hormone DHEA, neuropeptide Y and other biochemicals rush in, restoring equilibrium and easing symptoms, such as hypertension. Acutely, these mediators, along with emotional engagement with a task, may enhance learning.

But when stress is chronic, cortisol erodes health. Immune suppression, hypertension, bone mineral loss, muscle wasting and metabolic disorders ensue.[1]

hronic over-secretion of stress hormones adversely affects brain function, especially memory. Too much cortisol can prevent the brain from laying down a new memory, or from accessing already existing memories.[2]

The renowned brain researcher, Robert M. Sapolsky, has shown that sustained stress can damage the hippocampus , the part of the limbic brain which is central to learning and memory. The culprits are "glucocorticoids," a class of steroid hormones secreted from the adrenal glands during stress. They are more commonly know as corticosteroids or cortisol.[2]

Excessive cortisol can make it difficult to think or retrieve long-term memories. That's why people get befuddled and confused in a severe crisis. Their mind goes blank because "the lines are down." They can't remember where the fire exit is, for example.[2]

Norepinephrine balances the bad sideeffects of cortisol.
A highly motivated person working under heavy load goes into a potential disaster if something happens that removes the motivation abruptly. Norepinephrine supply suddenly stops and his brain faces an abundant amount of cortisol alone. This is why motivation control both by individuals and the management is so important on large systems. A manager can easily and permanently hurt an employee who is working under heavy load with high motivation. Punish the person who expects a reward. He will be mentally sacked.

Kindling namely growth of neural paths unconsciously under continuous stress. This may explain the situations when somebody feels stress without any reason or remembers a stressful experience at the moment he feels stress about an important problem triggered by some other and simple reason.

"Kindling rewires the brain. the brain reshapes itself anatomically in response to small noxious stimuli.
Kindling appears to be a kind of learning, but a learning that can occur independent of cognition. Illness, once expressed, can become responsive to ever smaller stimuli and, in time, independent of stimuli altogether. The expression of the disorder becomes more complex over time[3]."

If a neural path is used it gets stronger.
The more it is used the stronger it becomes. Our childhood memories are renewed like this[3].

Over time, repeated stressful experiences can literally, not just figuratively, alter the nervous systems of the temperamentally vulnerable. Animal research has shown that when a rat is given a small shock, it shows no marked reaction; when exposed to such stressors for five consecutive days, it shows signs of the stress response; when exposed for seven or eight days, the rat has a seizure, and thereafter this 'kindled' animal will seize with little or no provocation[3].

When a temperamentally vulnerable person is constantly bombarded with upsetting stimuli, Gold says, the genes that get turned on are those involved in the cellular components of the stress response[3]."

"Suppose a major traumatic stressor occurs, of a sufficient magnitude to disrupt hippocampal function while enhancing amygdaloid function. At some later point, in a similar setting, you have an anxious, autonomic state, agitated and fearful, and you haven't a clue why this is because you never consolidated memories of the event via your hippocampus while your amygdala-mediated autonomic pathways sure as hell remember[3]."

It is proved that people who have a larger number and more social relations have bigger amygdala volumes[4,5].

People who have few and weakly inadequate social relations are at the risk of getting smaller amygdala and hence they are faced with the risk of getting related mental problems Postmortem studies of schizophrenic patients have found significant amygdala volume reductions as well as of other medial lymbic structures (Bogerts 1984; Bogerts et all., 1985)[6].

Bruce McEwen, a professor of neuroendocrinology at the Rockefeller University

Linking the nervous and endocrine systems, biochemical mediators regulate the effects of stress, which are exacerbated by health-related behaviors such as inactivity or poor diet . Under acute stress think fight or flight the hypothalamus churns out corticotropin-releasing hormone, prompting a sharp rise in the stress hormone cortisol, which enhances immunity, memory, energy and cardiovascular function. Once the stressor has passed, the hormone DHEA, neuropeptide Y and other biochemicals rush in, restoring equilibrium and easing symptoms, such as

hypertension. Acutely, these mediators, along with emotional engagement with a task, may enhance learning.

But when stress is chronic, cortisol erodes health. Immune suppression, hypertension, bone mineral loss, muscle wasting and metabolic disorders ensue. Within the hippocampus and amygdala, seats of memory and emotion, dendrites shrink and synapses vanish, McEwen has shown. Cognitive function declines, depression sinks in, the immune system weakens, and metabolism goes awry. In a study of medical students preparing for board exams, McEwen's collaborators found that higher levels of perceived stress predicted poor mental flexibility and reduced functional connectivity in the prefrontal cortex.

The good news: These ill effects are reversible, McEwen said. Regular exercise returns the hippocampus to normal size and improves memory, for example, while mindfulness training reduces the amygdala's volume and curbs anxiety. Many adult diseases could be prevented by reducing toxic stress in utero and in early childhood, he said.

[2] Resources for Science Learning, The Franklin Institute, The Human Brain, Unisys.

Attack of the Adrenals-A Metabolic Story

The ambulance siren screams it's warning to get out of the way. You can't move your car because you're stuck in a bumper-to-bumper traffic jam that reaches as far as the eye can see. There must be an accident up ahead. Meanwhile the road construction crew a few feet from your car is jack-hammering the pavement. You are about to enter the stress zone.

"Attention all parasympathetic forces. Urgent. Adrenal gland missile silos mounted atop kidneys have just released chemical cortisol weapons of brain destruction. Mobilize all internal defenses. Launch immediate counter-calm hormones before hippocampus is hammered by cortisol."

Hormones rush to your adrenal glands to suppress the streaming cortisol on its way to your brain. Other hormones rush to your brain to round up all the remnants of cortisol missles that made it to your hippocampus. These hormones escort the cortisol remnants back to Kidneyland for a one-way ride on the Bladderhorn. You have now reached metabolic equilibrium,

also known as homeostasis.

Stress and Memory

Chronic over-secretion of stress hormones adversely affects brain function, especially memory. Too much cortisol can prevent the brain from laying down a new memory, or from accessing already existing memories.

The renowned brain researcher, Robert M. Sapolsky, has shown that sustained stress can damage the hippocampus , the part of the limbic brain which is central to learning and memory. The culprits are "glucocorticoids," a class of steroid hormones secreted from the adrenal glands during stress. They are more commonly know as corticosteroids or cortisol .

During a perceived threat, the adrenal glands immediately release adrenalin. If the threat is severe or still persists after a couple of minutes, the adrenals then release cortisol. Once in the brain cortisol remains much longer than adrenalin, where it continues to affect brain cells.

Cortisol Affects Memory Formation and Retrieval

Have you ever forgotten something during a stressful situation that you should have remembered? Cortisol also interferes with the function of neurotransmitters, the chemicals that brain cells use to communicate with each other.

Excessive cortisol can make it difficult to think or retrieve long-term memories. That's why people get befuddled and confused in a severe crisis. Their mind goes blank because "the lines are down." They can't remember where the fire exit is, for example.

Why We Lose Our Memory

Stress hormones divert blood glucose to exercising muscles, therefore the amount of glucose - hence energy - that reaches the brain's hippocampus is diminished. This creates an energy crisis in the hippocampus which compromises its ability to create new memories.

That may be why some people can't remember a very traumatic event, and why short-term memory is usually the first casualty of age-related memory loss resulting from a lifetime of stress.

Cortisol and Temporary Memory Loss-Study

In an animal study, rats were stressed by an electrical shock, and then made to go through a maze that they were already familiar with. When the shock was given either four hours before or two minutes before navigating the maze, the rats had no problem. But, when they were stressed by a shock 30 minutes before, the rats were unable to remember their way through the maze.

This time-dependent effect on memory performance correlates with the levels of circulating cortisol, which are highest at 30 minutes . The same thing happened when non-stressed rats were injected with cortisol. In contrast, when cortisol production was chemically suppressed, then there were no stress-induced effects on memory retrieval.

According to James McGaugh, director of the Center for the Neurobiology of Learning and Memory at the University of California, Irvine, "This effect only lasts for a couple of hours, so that the impairing effect in this case is a temporary impairment of retrieval. The memory is not lost. It is just inaccessible or less accessible for a period of time."

Cortisol and the Degenerative Cascade

Normally, in response to stress, the brain's hypothalamus secretes a hormone that causes the pituitary gland to secrete another hormone that causes the adrenals to secrete cortisol. When levels of cortisol rise to a certain level, several areas of the brain - especially the hippocampus - tell the hypothalamus to turn off the cortisol-producing mechanism. This is the proper feedback response.

The hippocampus, however, is the area most damaged by cortisol. In his book Brain Longevity, Dharma Singh Khalsa, M.D., describes how older people often have lost 20-25% of the cells in their hippocampus, so it cannot provide proper feedback to the hypothalamus, so cortisol continues to be secreted. This, in turn, causes more damage to the hippocampus, and even more cortisol production. Thus, a Catch-22 "degenerative cascade" begins, which can be very difficult to stop.

Cortisol and Brain Degeneration-Study

Studies done by Dr. Robert M. Sapolsky, Professor of Neurology and Neurological Sciences at

Stanford University, showed that lots of stress or exposure to cortisol accelerates the degeneration of the
aging hippocampus

And, because the hippocampus is part of the
feedback mechanism that signals when to stop cortisol production, a damaged hippocampus causes cortisol levels to get out of control - further compromising memory and cognitive function . The cycle of degeneration then continues. (Perhaps similar to the deterioration of the pancreas-insulin feedback system.

Cortisol Levels During Human Aging-Study

The study was
titled "Cortisol levels during human aging predict hippocampal atrophy and memory deficits". A third of the 60 volunteers, who were between ages 60 and 85, had chronically high cortisol levels, a problem that seems to be fairly common in older people.

The size of the
hippocampus averaged 14% smaller in one group and showed high and rising cortisol levels, compared to a group with moderate and decreasing levels. The small hippocampus group also did worse at remembering a path through a human maze and pictures they'd seen 24 hours earlier and - two tasks that use the hippocampus.

12. Nature, Aug 20, 1998

MyBrainNotes.com,
Subcortical Brain Structures, Stress, Emotions,
and Mental Illness

Is it possible that chronic
stress, through a process called , can create hard-wired,
hypersensitive neural networks capable of dictating and automating symptoms from a wide range of instinctual behavior patterns? In his video course, Biology and Human Behavior: The Neurological Origins of Individuality , 2nd edition, Robert M. Sapolsky examines how
communication between neurons is strengthened as a result of experience When the dendritic spines of neurons are stimulated rapidly, the synapses
between the communicating neurons become "hyper-responsive or potentiated" due to chemical changes within the neural environment. Subsequently, less stimulation is necessary to again prod the neuron to fire the moment when an electrical signal bursts through the neuron's axon,

prompting release of chemical messengers called neurotransmitters into the synapse between neurons, often increasing the likelihood that other neurons will fire in a sort of chain reaction. In other words, Sapolsky says, the neuron's "action potential" is increased. What's called "long-term potentiation" is thus the basis for learning and memory, possibly including injurious forms of learning such as post-traumatic stress disorder (PTSD).

Listening to Prozac: A Psychiatrist Explores Antidepressant Drugs and the Remaking of the Self "Kindling rewires the brain. the brain reshapes itself anatomically in response to small noxious stimuli. Kindling appears to be a kind of learning, but a learning that can occur independent of cognition. Illness, once expressed, can become responsive to ever smaller stimuli and, in time, independent of stimuli altogether. The expression of the disorder becomes more complex over time."

Psychosomatic disease and the 'visceral' brain: Recent developments bearing on the Papez theory of emotion " (1949), Paul D. Maclean theorized about the kindling process . "It is possible that if a certain electrical pattern of information were to reverberate for a prolonged period or at repeated intervals in the neuronal circuit, the nerve cells (perhaps, say, as the result of enzymatic catalysis in the dentritic processes at specific axone-dendritic junctions) would be permanently 'sensitized' to respond to this particular pattern at some future time. Such a mechanism would provide for one variety of enduring memory in a way that is remotely analogous to a wire recorder. These hypothetical considerations suggest how oft-repeated childhood emotional patterns could persist to exert themselves in adult life."

, certain reactions are not embedded in language and intellect, they are more like "gut feelings" that can remain in primordial memory systems and that can be strengthened through kindling. Winifred Gallagher explains kindling in an article in How We Become What We Are

Over time, repeated stressful experiences can literally, not just figuratively, alter the nervous systems of the temperamentally vulnerable. Animal research has shown that when a rat is given a small shock, it shows no marked reaction; when exposed to such stressors for five consecutive days, it shows signs of the stress response; when exposed for seven or eight days, the rat has a seizure, and thereafter this 'kindled' animal will seize with little or no provocation .

Experiments of this kind are of course not done with people, but Philip Gold and other neuroscientists now think that in human beings, too, by triggering a cascade of chemical reactions, serious chronic stress, particularly in early life, causes changes in the way genes within a brain cell function, permanently altering the neuron's biology. Because they require a particular type of input to turn on or off, only some of a neuron's thousands of genes, each of which is involved in some aspect of cellular structure or communication, are activated at any given moment . When a temperamentally vulnerable person is constantly bombarded with upsetting stimuli, Gold says, the genes that get turned on are those involved in the cellular components of the stress response."

I contend that neurotransmission in the amygdalae and their target structures is sometimes to generate dopamine-driven behaviors aimed at solving problems including restoring order, control, and most importantly-confidence. Under normal circumstances, this could be construed as a survival instinct. Under extreme stress, however, especially when an outlet for pent-up energy is not available, these behaviors may turn into obsessions or compulsions. We will discuss such neurotransmission in greater detail in Part 3 of MyBrainNotes.com. For now, I would like to point out that in Monkeyluv and Other Essays on Our Lives as Animals (2005), Robert M. Sapolsky describes how monkeys release dopamine in of a food reward. They get most excited when a light first comes on signaling that they may now perform a learned task and upon completion, will receive food. Their excitement does not peak when the food finally appears; it peaks well before that point. Sapolsky writes, "It's about the anticipation of reward. It's about mastery and expectation and confidence."

Another example of kindling, which we discuss above, is the effects of stress on the hippocampi. In his 1995 article titled, " Severe Trauma May Damage the Brain as Well as the Psyche ," Daniel Goleman explains that studies in rats and primates suggest that glucocorticoids are the culprit. Goleman quotes Robert Sapolsky, who explains that glucocorticoids "may be neurotoxic to the hippocampus at the massive levels that are released under extreme stress or during trauma. I'm talking about the levels you would see in a zebra running from a lion, or a person fleeing a mugger□a real physical life-and-death crisis□if it is repeated again and again as time goes on."

If the glucocorticoids released during extreme stress and trauma damage the hippocampi, it is no wonder that, according to Sapolsky in Why Zebras Don't Get Ulcers , "there is atrophy of the hippocampus in long-term depression . The atrophy emerges as a result of the depression (rather than precedes it), and the longer the depressive history, the more atrophy and the more memory problems."

Sapolsky points to the work of psychologists Martin Seligman and Steven Maier who exposed animals to "pathological amounts" of stress. "The result is a condition strikingly similar to a human depression." Sapolsky explains that it is "repeated" stress that generates depressive symptoms combined with "a complete absence of control on the part of the animal." In other words, the animal has no outlets that can be used to vent frustration. "When it comes to what makes for psychological stress, a lack of predictability and control are at the top of the list of things you want to avoid," Sapolsky writes.

href="http://www.scholarpedia.org/article/Emotional_memory" Joseph LeDoux of New York University, "who pretty much put the amygdala on the map when it comes to anxiety." In a way that only he can do, Sapolsky sums up the paradox between severe, traumatic stress and its effect on the hippocampi versus the amygdalae. "Suppose a major traumatic stressor occurs, of a sufficient magnitude to disrupt hippocampal function while enhancing amygdaloid function. At some later point, in a similar setting, you have an anxious, autonomic state, agitated and fearful, and you haven't a clue why this is because you never consolidated memories of the event via your hippocampus while your amygdala-mediated autonomic pathways sure as hell remember."

We found that amygdala volume correlates with the size and complexity of social networks in adult humans. An exploratory analysis of subcortical structures did not find strong evidence for similar relationships with any other structure, but there were associations between social network variables and cortical thickness in three cortical areas, two of them with amygdala connectivity. These findings indicate that the amygdala is important in social behavior.

In this study we examined whether amygdala volume varies with individual variation in the size and complexity of social groupings within a single primate species, humans. In 58 healthy adults (22 females; mean age = 52.6, s.d. = 21.2, range = 19-83 years) with confirmed absence of DSM-IV Axis I diagnoses and normal perform-ance on cognitive testing, we examined social network size and com-plexity with two subscales of the Social Network Index (SNI9).

Linear regression analyses revealed that individuals with larger and more complex social networks had larger amygdala volumes (

Amygdala volume
correlates positively with both the size (the number of contacts a person has)
and the complexity (the number of different groups to which a person belongs)
of Individuals
with larger amygdalae had larger and more complex social networks. They were
also better able to make accurate social judgments about other persons' faces. It is hypothesized that
larger amygdalae allow for greater emotional
intelligence, enabling greater societal integration and cooperation with
others.

6] Ivone-CastroVale, Lilianna de
Sousa, Maria Amelia Tavares, Rui Coelho; PSICOSSOMATICA 2002, Knowing the
Amydala: Its Contribution to Psychiatric Disorders

Postmortem studies
of schizophrenic patients have found
significant amygdala volume reductions as well as of other medial lymbic
structures (Bogerts 1984; Bogerts et all., 1985).

Measures of amydala volumes with MRI of 46 schizophrenics compared
to 60 normal controls and 27 bipolar subjects found right amygdala volumes
smaller in schizophrenia and left amygdala volumes smaller in
bipolar